THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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Reading Matter Contents .....page 58
Alphabetical Index to Advertisers " 145
Classified List of Advertisers .... " 147
Advertising and Subscription Rates " 69

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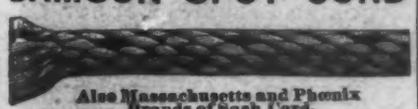

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THE IRON AGE

THURSDAY, JANUARY 23, 1902.

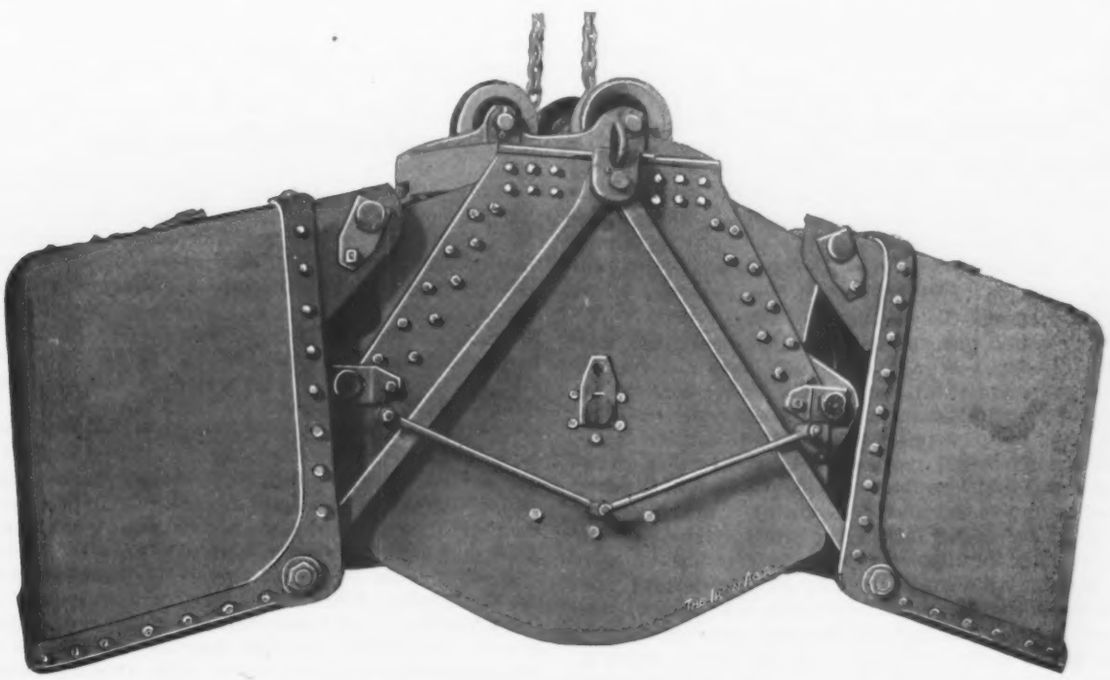
A New Machine for Ore Unloading.

There will be installed on the docks of M. A. Hanna & Co. at Ashtabula, Ohio, prior to the opening of the next season of navigation, a new form of apparatus for unloading iron ore from lake vessels which is commonly accounted an improvement upon the Hulett automatic ore unloader, which attracted so much attention when introduced on the unloading docks of the Carnegie Company at Conneaut, Ohio, a year or two ago. More strictly speaking, the new invention should perhaps be described as a new device of distinctively original type, but suggested by the automatic unloader previously mentioned. The new machine is not so ponderous as the old form of automatic unloader, and it is claimed that the cost of operation will be considerably less.

In the Hulett automatic unloader, several of which have been in use for a full year past on the docks at Conneaut, the principal feature is a leg or mast depending from a heavy walking beam and supporting at its lower end a clam shell bucket. In the new machine the fundamental factor is found in a new style excavating bucket, which, instead of depending from a heavy mast, is suspended by chains from a trolley. The new and old style buckets are each operated on the clam shell plan, but here the similarity ends. The new bucket weighs about 4 tons, or less than the old style, but it presents a proportionate reduction in capacity, inasmuch as it will hold but 3 or 4 tons of medium grade soft ore or 2 or 3 tons of crushed hard ore, as compared with the 10-ton capacity of the clam shells at Conneaut. This new excavating bucket has been thoroughly tried in iron ore, and the experiments have proved that in the case of many of the soft ores it can pick up more than its own weight of ore. An important qualification of the new excavating utensil is found, of course, in the fact that it works with the ordinary type of conveyor.

Another radical departure from the plan of the automatic unloaders first introduced is found in the fact that the clam shell is, in the case of the new machine, provided with a mechanical helper in the hold of the vessel. In the type of machine first introduced the depending mast, which, by the way, contains a cage for the operator, revolves in a complete circle. Inasmuch as the clam shell bucket has, when open, a radius of 9 feet, it was supposed that it could not only reach over the space intervening between the hatches, but that its arms would also reach to the bilge of the vessel. It was not believed originally that more than 10 per cent. of the ore forming a cargo would have to be shoveled by hand to within range of the scoop, but in actual practice it was found that the percentage was somewhat higher than that, and in consequence it has been necessary in most instances to supplement the services of an automatic unloader at Conneaut with a force of from 12 to 15 hand shovelers.

In the plant under construction at Ashtabula no effort will be made to have the clam shells pick up other than the ore immediately under the hatches, which, it may be explained, are 8 feet fore and aft and spaced 24 feet centers. After the ore—estimated at 50 per cent. of the entire cargo—originally lying directly under the hatches has been removed by the excavating bucket the remainder of the ore will be drawn under the hatches and within range of the scoop by means of an auxiliary machine fitted with a scraping device.



NEW MACHINE FOR ORE UNLOADING.

This mechanical assistant is built as a part of the same conveyor which supports the excavating bucket, and may be operated simultaneously with the latter without interfering in any way. The scraping device is provided with a depending tube, in which the operator is stationed, on the same plan as in the depending mast of the type of automatic unloader at Conneaut. Indeed, this feature of the machine is closely patterned after that part of the original Hulett unloader, and the whole principle of the new invention is to more distinctly separate the loading and conveying functions of the machine.

The operator, whose cage is in the depending mast, is thus directly over the scraping device and is in full control of all its movements. An electric motor operates the scraper, which has perpendicular, horizontal and rotating movements, and has a "reach" of 15 feet from the center of rotation, thus affording it, as will be seen, a radius of action somewhat greater than that of the large clam shell in the original Hulett unloader. The main advantage in this new piece of apparatus is found in the fact that it is designed simply to scrape or drag the ore into position under a hatch where the excavating bucket can reach it, and consequently there is no necessity for the heavy and ponderous construction which was essential when the excavator had to not only scoop in the ore, but also withstand the strain of lifting several tons of ore out of the hold and back over the dock. It is claimed that these two devices working in conjunction will take out as great a proportion of a cargo of ore as can ever be handled by purely mechanical means, and that not more than one or two men will be required for hand shoveling.

The new machine is being built by the Webster, Camp & Lane Machine Company of Akron, Ohio, who constructed the automatic unloaders on the Carnegie docks at Conneaut. It was designed by F. E. Hulett, but the operating machinery was designed by G. H. Hulett, who was responsible for the entire plan of the original automatic unloader. The apparatus to be installed at Ashtabula may be designated as the third step in the evolution of his ideas regarding an automatic unloader, for after building the initial unloader at Conneaut he conceived and carried into execution a project for amalgamating two such machines into a single apparatus, one being of considerably lighter construction than the other. In this apparatus the operation of the lighter mechanism was supplementary to that of the heavier. The more powerful portion of the machine was designed to remove the great bulk of the ore from underneath a hatch, and when it moved to the next hatch the other portion of the apparatus, accurately gauged to exactly the necessary distance behind it, performs the cleaning up work.

It is claimed that the new style automatic unloader to be introduced at Ashtabula will have the further advantage that it will be capable of a much wider range of work, particularly in transferring iron ore from ships to stock piles, than was the original automatic machine, since the ponderous construction of the latter entailed a very costly expenditure of time when it was desired to place ore on a stock pile some distance back from the dock. Indeed, the original automatic unloader could only be used with satisfaction when it was possible to load ore directly on the railroad cars provided to carry it to the furnaces, for when it was desired to stock the material it was necessary to have the clam shell bucket unload into small cars, which in turn operated on a trestle carrying the ore out to the stock piles at the rear of the dock. All this will be obviated in the new machine, which will be capable of transferring direct to stock pile without loss of time. A reduction of the cost of unloading iron ore to a small percentage of the present cost is also claimed for the new machine.

The officials connected with the Chicago Drainage Canal are sanguine of Government encouragement for the project of continuing the navigable waterway afforded by the Drainage Canal from its terminus at Joliet to the Mississippi River. This canal has for its primary object the disposal of the sewage of Chicago. In the construction of the canal, however, a sufficient depth was provided to make the entire 40 miles navigable for vessels of large size. It was hoped from the inception of this project that the United States Government might in time be induced to deepen the Des Plaines and Illinois rivers, so as to make a continuous navigable channel from Lake Michigan to the Mississippi River over this route. Efforts are being made to secure an appropriation of $200,000 to be expended by the Government in making a survey and estimate of the cost of constructing a waterway 14 feet deep. It is expected that if this appropriation is made the work of survey will be completed within two years, and an appropriation can then be asked for the work of construction. So much interest is being taken in this project for improving Western water communication that the hope of its consummation seems to be reasonable.

The Cedar Point Furnace.

Pilling & Crane, Girard Building, Philadelphia, have leased the Cedar Point Furnace, owned by Witherbee, Sherman & Co., Incorporated, located at Port Henry, N. Y. The furnace is 16 x 71 feet in dimensions, equipped with fire brick stoves, and has previously had a capacity of 100 tons per day. It is to be thoroughly remodeled and modernized, equipped with new boilers and an additional blowing engine, bringing its capacity to 5000 to 6000 tons per month. There will be used principally concentrates, Old Bed 21 and Harmony ore from the mines of the Witherbee, Sherman & Co., mixing, if necessary, other suitable ores to secure best results in the furnace. The fuel will be anthracite and coke, and the product principally basic pig, although foundry, mill and malleable iron may also be produced. Frank E. Bachman, at the present time superintendent of the Buffalo Union Furnace Company, Buffalo, N. Y., has been secured as general manager, and Frank C. Roberts & Co. of Philadelphia have been engaged to cooperate with him in remodeling the plant. It is expected that the plant will be in operation by April 1. A corporation will be organized to take over the lease.

Central Pennsylvania News.

HARRISBURG PA., January 21, 1902.—The middle of the first month of the year found all of the works in this city and vicinity in operation and prospects even better than they were a fortnight ago. With the first week of the year there was more inquiry and considerable booking of orders. All of the rolling mills here and at Lebanon have placed orders for summer and fall delivery, and the spring promises to be very busy. On the first of the year the high water mark in number of men employed is believed to have been reached, as every works had its full force employed. At the Pennsylvania Steel Works the December roll totaled 7744 names. These figures will be increased before many months as additional departments are put into operation. In this city there are to be some additions to mills, and there is talk of a new pipe works.

No. 2 Paxton Furnace in this city has been blown out for repairs, but will be started in February. On and after February 1 the Paxton furnaces will be under the management of Mr. Amsden, lately with the Tidewater Steel Company of Chester. Charles Forney, the present superintendent, will take charge of a plant in the western part of the State.

Molders in the Wilkes-Barre-Pittston-Scranton district asked for a new scale of wages. They want $2.75 per day.

The Middletown Car Works have taken up the manufacture of steel frame cars, and have many orders on their books.

The Pennsylvania Steel Company have taken orders for many rails for late delivery this year. One large order is for the Mexican national railways.

The Lebanon Rolling Mill Company's charcoal plant has been removed to Lickdale, near that city. It is said that a better supply of wood can be obtained at the new site.

The American Iron & Steel Mfg. Company are installing additional boilers at their Lebanon works. S.

Representatives of Amalgamated lodges and other labor organizations in the Wheeling district met on Sunday, January 19, to arrange for the national convention of the Amalgamated Association, to be held in Wheeling in April next. The Board of Trade of Wheeling will co-operate in providing finances.

Shipbuilding on the Lakes.

Annual shipbuilding statistics of the great lakes show some interesting conclusions, as well as some remarkable totals. There are in lake yards so many ships under way that no new orders can be delivered before the spring of 1903. In fact, several orders have been refused simply because lake builders cannot deliver in time for the vessels to be of use during the coming season of navigation. This condition of things bids fair to continue into another year. There are plans in the offices of shipping concerns on the lakes that will go far toward maintaining lake yards at their present condition during the winter of 1902-1903. And while the construction of freight ships has been almost the sole line of activity on the lakes for many years, with the exception of the three big ships, "North Land," "Northwest" and "Manitou," there is to be a boom in the passenger line, and a number of fine ships for service from Lake Erie to lakes Superior and Michigan are soon to be laid down.

Shipbuilding on the lakes for the past four years can be summarized as follows, omitting the intermediate year 1900:

	1902.	1901.	1899.
Number of ships.....	48	59	26
Steel	46	54	20
Wood	2	6	6
Built by American Shipbuilding Company.....	34	34	..
Built by independent builders	14	25	26
For lake service.....	46	54	26
For ocean service.....	2	5	..
Cargo ships.....	38	48	15
Trip capacity, tons.....	190,000	174,000	71,400
Season capacity, tons...	3,700,000	3,300,000	1,430,000
Steam propulsion.....	44	54	20
Towing barges.....	4	5	6
Cost $10,875,000		$11,740,000	$2,980,000

While there were more ships under way on the lakes a year ago than there are now, their seasonal capacity was less by 400,000 tons, so many of them were small craft, passenger boats and tugs.

After years of experiment and argument on the part of lake shipowners and builders, three things have apparently been settled at last. The most important perhaps is that of the economical size for cargo ships. Up to two years ago lake builders were constantly striving after bigger ships. They forced the Government to continually deepen and enlarge its connecting channels by being always in the lead with ships that could move on a greater draft than was available. They gradually increased their capacity, until in ten years they advanced from a maximum of 3000 to 8000 tons. Two years ago they built ships that carried 8000 net tons on a draft of 18 feet. The question was, When would the ultimate size be reached and where was the limit for profitable lake ships? Now, none of these biggest ships are being built. The type seems to have been abandoned. The universal agreement as to the proper size is a ship about 400 feet long, varying perhaps 30 to 40 feet either way, 50 feet beam and 28 feet depth, with a capacity of from 5000 to 6000 tons. This agreement was foreshadowed a year ago, and now it is very evident. Every one of the 28 cargo ships under way by the American Shipbuilding Company is of this class of handy business boats.

There is consensus of opinion after long trial and agitation on another point, and that is that the towing type of barge, to be pulled by a steamer, is not economical. Three and four years ago it was the plan of the leading builders of lake tonnage that they should have two barges for every steamship, the barges to be pulled from port to port by the steam vessel. To-day there is not one steel barge under way for American owners. Of the four building two are for a Canadian interest, and the remaining are of wood, to go with the steamers of a line owned by a shipbuilding yard. The experience of 1901, when many barges were wrecked and when steamers suffered much delay in ports waiting for their consorts to be made ready, has crystallized the sentiment against barges into solidity. It is now universally believed that no valuable ship and cargo should be afloat without some means of propulsion if the cable between it and the steamship ahead is broken by severe weather, and that the immense additional weight of barge and cargo, which often reaches 10,000 gross tons, is too much for any steamship to be obliged to care for in extreme weather. The strain of such a weight hanging behind and buffeted by head waves and winds seems almost enough sometimes to pull the stern out of a ship.

Another change, more manifest than ever, though it has been coming for years, is the elimination of the wooden ship. But two of these are now under way, neither of them steamers. There is now but one shipyard on the lakes that builds vessels of wood.

The spasmodic attempt of lake shipowners to build vessels for combined lake and ocean service, doomed from the first, the statistics of this year show to have been utterly abandoned. Not one ship for this service is now under way. The two ships for ocean service shown in the tables are of a size so large that when once taken to the sea they can never return. Even these two were under way more than a year ago, and are not to be considered in the development of lake shipbuilding ideas in 1902. They are both 7000-ton ships, too long to be floated out of the lakes, and will be cut in two before leaving Lake Erie, and jointed together again below the St. Lawrence canals. Even this class of competition with the shipbuilders of the Atlantic Coast, thought for some time to have important bearing on the future, will probably be abandoned if the lake yards can find sufficient work to keep them even fairly busy.

The new ships destined for lake cargo use will give an increased capacity on the lakes for the coming year, reductions by wrecks deducted, of about 3,000,000 tons for 1902. It is possible that the commerce of the lakes will increase this much in the year; the average increase for each of the four preceding years was 2,350,000 tons, counting the business of Lake Superior alone. But last year the actual capacity of the fleet then in commission was diminished about 3,000,000 tons by a short season and by delays and detentions at docks, so that if there are no such delays the coming season the vessels of 1902 will be able to readily move 6,000,000 tons more freight than last year. This will mean a total increase of more than 10 per cent.

Passenger traffic of the great lakes is increasing to such an extent that present accommodations are not sufficient. It is expected that by the spring of 1903 there will be at least five splendid and commodious passenger vessels added to the steel fleet of the lakes, all for the long interlake service, as distinguished from the ships running between Buffalo and other Lake Erie ports.

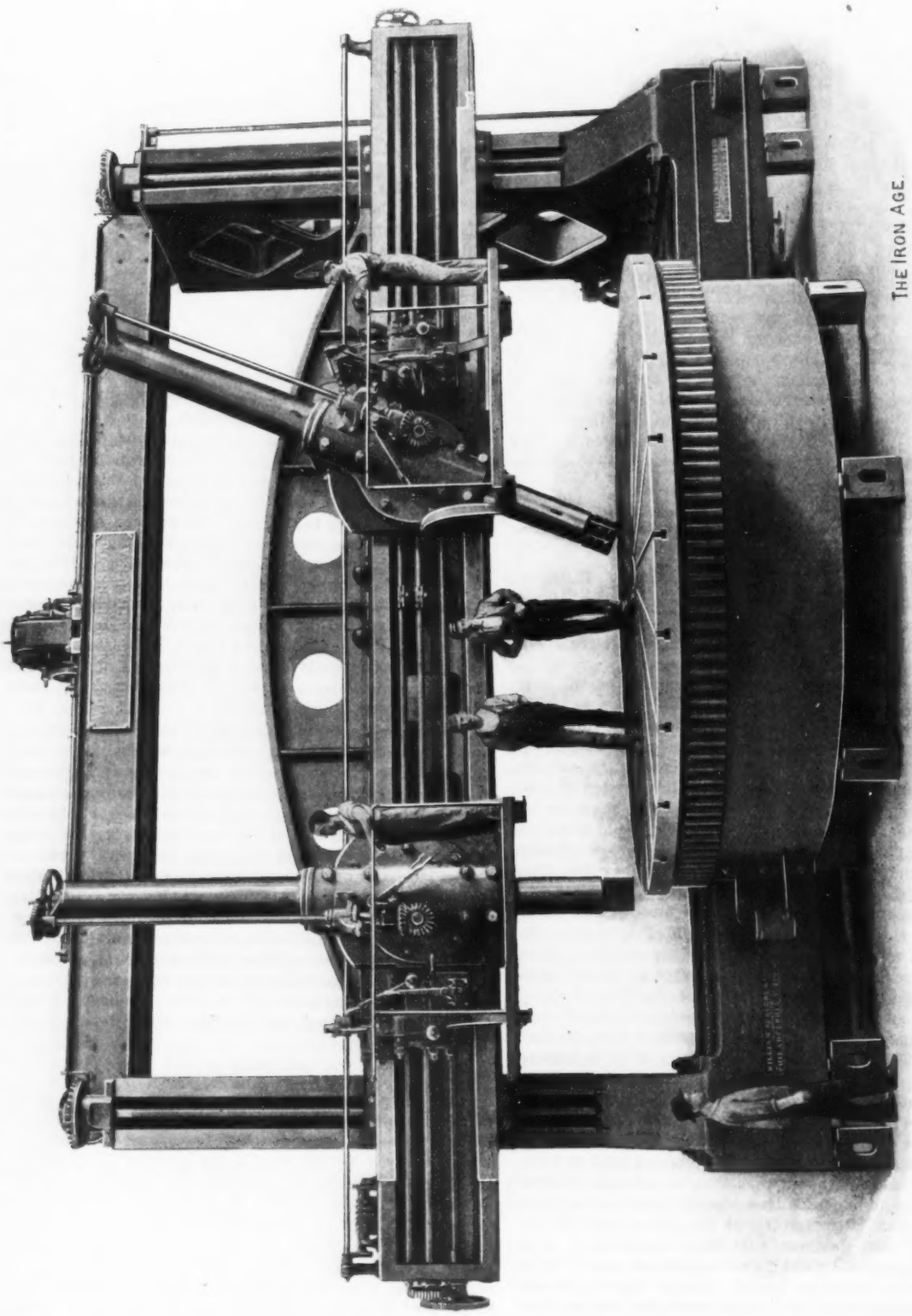
An interesting feature of the present situation is that not a ship is building for interests directly controlling large freight tonnages, like the United States Steel Corporation, whose constituent interests were, before its formation, chief among the builders of vessels. Independent vessel owners control all the new tonnage, some of them with assurances of business in long time contracts with grain, coal, ore and other traffic departments.

D. E. W.

The remarkable development in the use of sheet metal for purposes for which cast metal or wood were formerly used is a pronounced feature of construction work to-day. As an illustration of this development the Ferracute Machine Company of Bridgeton, N. J., advise us that they recently furnished to a foreign government an outfit of machinery for making the sliding carriages which deliver the cartridges into rapid firing guns. These sheet metal carriages weigh only 2 pounds each, whereas the phosphor bronze carriages formerly used weighed 30 pounds and cost about ten times as much as those of sheet metal. Moreover, the sheet metal carriages have the additional advantage that a much larger number can be carried on mule back and other forms of transportation. The company have been officially advised that the carriages made by their machines have proved very successful in use. There is undoubtedly a growing tendency to replace castings and forgings with sheet metal in many different lines of work.

The Sellers 28-Foot Boring and Turning Mill.

The 28-foot boring and turning mill which we here illustrate, designed and built by Wm. Sellers & Co., Incorporated, of Philadelphia, represents in several respects a new departure in machines of this character. Not only is the size very great, the diameter of the table being 18 feet 4 inches, and the swing 28 feet, but there are certain features of marked originality. Probably the most striking of these novelties is the manner in which the cross rail is stiffened to resist torsional stresses. In the usual construction of boring and turning mills and planing machines the torsional strength of the cross head or cross rail to resist the tool pressure is measured by the strength of the casting at or near the housings. The depth at this point—that is, the distance from the front to the back face, must obviously be kept as small as practicable, and the front must be hollowed out in a trough like form to afford room for the screws and feed rods. The resulting section is not one well adapted to withstand torsional strains, and no amount of "back swell" in the center of the beam will increase the torsional strength at the weakest section, although doubtless of importance in resisting the horizontal forces.



THE SELLERS 28-FOOT BORING AND TURNING MILL.

In the boring and turning mill before us the housings are made of rectangular section, the front and back

edges being parallel. The cross rail is extended back to the rear face of the housings, where an additional pair of elevating screws and clamping shoes are provided.

The cross head bar measures 7 feet 6 inches from the front face of the housings to the clamping point on the rear, while the depth is 40 inches. When this great beam, which is thoroughly braced by internal diagonal webs, is secured by the front and back to the housings, a degree of rigidity is afforded hitherto not obtained in machines of this character. The front of the cross head is further stiffened to resist the vertical loads due to the saddles and boring bars by a curved beam measuring over 43 inches deep in the middle and bolted to the top of the cross rail between suitable cast abutments.

When the cross rail is clamped up for work it is so thoroughly braced to the two housings that no further connection between them is needed at the upper ends than such a member as may be required to carry the elevating machinery. This is provided in two 20-inch I-beams, which support in their center the electric motor used for raising and lowering the cross rail, as well as the necessary shafts, wheels and bearings.

Two saddles are provided, each carrying a 12-inch boring bar of 7-foot stroke. Attached to each of the saddles there is a convenient platform for the operator, and from this position he can control all the movements of the saddle and boring bar. The feed screw for horizontal adjustment is stationary, and both saddles have nuts engaging with the screw. Each saddle carries its own feeding mechanism, with change wheels for altering the speeds of feed, and there are within the cross rail two shafts from which power may be taken. The first, which is used for regular feeds, is driven by the driving gear of the boring and turning mill, and runs at a constant speed in relation to the table, while the other shaft is operated by a motor on the back of one of the overhanging ends of the cross rail, which may be stopped and started from either saddle, and is used to drive the rapid traverse mechanism. The saddles can be moved along the cross rail or the bar raised or lowered by rapid power traverse, and with great nicety.

The operating levers are so interlocked that the rapid traverse cannot be thrown in for one saddle unless it is disengaged from the other, so that it is impossible for the operator on one head to move the opposite head accidentally. Convenient levers are arranged for throwing in the various movements, so that the operator has perfect control of the movement of the boring bars in every direction.

The vertical feed is accomplished by the heavy screw passing within the boring bar, and is sufficiently powerful to enable the bar to be used for slotting large key seats where desired.

The great length of the cross rail, nearly 39 feet, makes it necessary to provide intermediate bearings, and ingenious drop hangers are provided, which will move out of the way as the saddles travel along the rail, but when in action they hold the shafts effectively in closed bearings.

The table is provided with external spur gearing, protected by an overhanging edge, and is carried on two wide, flat annular bearings, and centered by a spindle 25 inches in diameter in a bearing adjustable for wear.

To insure a thorough lubrication of all the table bearings a centrifugal force pump is provided, which delivers the oil to the vital points, and the overflow is collected, passed through filters and returned to the pump tank by gravity. This system has proved eminently satisfactory in practice, and the lubrication has been all that could be desired.

The table gear is 4⅝-inch pitch, 11-inch face, and the driving pinion is on the vertical shaft at the rear of the machine. Two changes of gearing are provided, and in the machine shown the drive is directly from an electric motor of 20 horse-power through a variable speed countershaft.

This machine was built for the British Westinghouse & Mfg. Company.

The Coke Situation at Chicago.—The coke situation has recently improved considerably at Chicago. The Illinois Steel Company were able to start up more of their furnaces the past week, and now have nine stacks in operation at their South Chicago Works. The one stack out of operation at this plant is undergoing repairs. They blew in one of their Milwaukee furnaces on Saturday. All their furnaces are now in operation at Joliet, one is running at their Union Works, one at Milwaukee, and one at their North Chicago plant. The Calumet Furnace of the South Chicago Furnace Company is in operation again, and it is expected that the new furnace of the Iroquois Iron Company, also at South Chicago, will be running by February 1. This puts a new face on the pig iron situation at Chicago, and will greatly relieve the Western iron trade.

The Eight-Hour Law in Government Work.

WASHINGTON, D. C., January 21, 1902.—The original programme of the House Committee on Labor to limit hearings on the pending eight-hour bill to three days' discussion, with the understanding that the first hearing would be given on the 16th inst., and the arguments finally closed on the 30th inst., so that the bill might be reported to the House on February 1, has been completely upset, owing to a development which had not been counted upon by the committee.

Chairman Gardner, the author of the bill, has decided to become a candidate for the United States Senate, and as the Senatorial canvass in New Jersey is now well under way, the eight-hour bill has become a matter of secondary importance to him. As a result, when the Committee on Labor convened on the 16th inst. the chairman was absent, and the roll call developed the fact that but five members were present, or several less than a quorum. The iron and steel interests were represented by ex-Secretary Herbert and Mr. Micou, who appeared for the Union Iron Works, Bath Iron Works, Midvale Steel Company, &c.; Judge McCammon, for the Carnegie Steel Company. Bethlehem Steel Company, and other interests; Judge Payson, for the Newport News Shipbuilding & Dry Dock Company, &c., and General Williams, for the Cramp Shipbuilding Company. Several representatives of labor organizations were also present, and the hearings would have begun at once had the committee been able to summon a quorum.

After some discussion it was decided to adjourn until the 23rd inst., but the announcement being made that Chairman Gardner would probably not be in Washington on that day, it was intimated to the various interests present that arguments would probably not begin until January 30. As the committee is pledged to devote at least three regular meeting days to hearings, it is obvious that the bill will be delayed not less than two weeks, and cannot be reported before February 17. This outcome, although unexpected, is very satisfactory to the interests desiring to be heard against the bill, as a number of prominent manufacturers from the Pacific Coast and other remote points have signified a desire to appear and argue against the bill. It now seems probable that the bill will not be taken up in the House before March 1, and its opponents therefore feel more confident than ever of their ability to defeat it in the Senate.

W. L. C.

The Inland Steel Plant.—The Inland Steel Company of Chicago are pushing as rapidly as possible the work of construction on their new open hearth steel plant at Indiana Harbor, Ind. The erection of the buildings has been delayed by difficulty in securing satisfactory shipments of the structural steel required for this purpose, but in the meantime the work of laying foundations for the steel furnaces and the machinery has been proceeding, and, now that building material is being received more rapidly, it is expected that no serious delays will be encountered in completing the works. From present appearances it is believed that the plant will be in condition to be producing steel some time in April. The works will consist of four 50-ton open hearth furnaces, a blooming mill and sheet mills. They will turn out light and heavy sheets up to ⅜ inch thick. The daily output of steel will be from 400 to 500 tons, and it will all be worked up in the company's finishing departments at Indiana Harbor and at Chicago Heights, Ill.

The Manufacture of Locking Bar Pipes in Western Australia.

BY STAFFORD RANSOME.

The relative merits of cast iron and riveted or welded wrought iron and steel pipes, for the purpose of conveying water under pressure, have long since been determined by theory and by practice. It is only lately, however, that the "locking bar" pipe has come into the field as a serious competitor to the established types of piping for this particular purpose. The principle of the "locking bar" pipe, which is merely a method of expressing what one knows more familiarly as a pipe having one or more longitudinal seams joined together by a channel bar of soft steel, the flanges of which are pressed onto the edges of the plates until a tight joint is effected, is by no means new. Nearly 19 years ago—to be exact, on April 28, 1883—letters patent were granted to Edwin Quadling for a pipe which is substantially similar to the Ferguson locking bar pipe, the making of which we are about to describe, except that the finished edges of the plates were slightly different in form. Another pipe, somewhat resembling this idea, was that patented by Frank Arthur Williams on July 28, 1892; but in this two longitudinal stringers were used in making a joint, a channel piece and a key. The Ferguson locking bar pipe has only one form of joint, and the essence of it is that the edges of the plates to be jointed are dovetailed, and, to attain this form, are upset, as shown in Figs. 1 and 2.

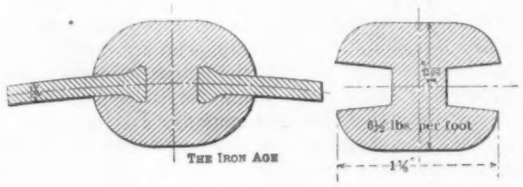


Fig. 1.—Locking Bar.

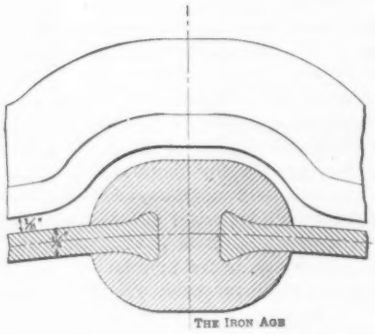


Fig. 2.—Joint Ring and Locking Bar.

So far, however, the difficulty with all pipes with this class of joint has not been so much the securing of a tight joint, as the designing of machinery which would effect this with sufficient rapidity and certainty. This Mr. Ferguson now claims to have done, and I was therefore very glad to have the opportunity of inspecting his factory at Falkirk, on the outskirts of Perth, in Western Australia, where these pipes are being made for the Coolgardie water supply.

Where This Pipe is Used.

Before dealing with the manufacture of these pipes, it is as well to point out the extent of the contract for which they are being made. On October 14, 1898, the Western Australian Government gave out contracts to the amount of £1,025,124 for locking bar piping alone, for the 325 miles of main supply between the first reservoir in the Greenmount ranges and Coolgardie. These contracts were taken up in two equal portions by Meysham Ferguson of Western Australia, the inventor of the system, and G. and C. Hoskins of New South Wales, who are manufacturing under license from the inventor. When first the Coolgardie scheme was mooted there was no question as to this type of pipe being used, and tenders from all available sources had been invited. When, at the last moment, Mr. Ferguson made his offer he was able to underbid all his competitors and to satisfy C. Y. O'Connor, the Engineer-in-Chief to the Western Australian Government, that his pipes would fulfill the requirement. The actual prices paid for these pipes delivered at a station close to the works is £16 10s. per pipe, 28 feet in length by 30 inches internal diameter, made of ¼-inch open hearth acid steel plates. In all there were 60,856 such pipes to be made, and 1000 more with plates 5-16 inch thick, for which the price was £21 per pipe. These prices are exclusive of joint rings, anchor plates, water or air valves, or any other fittings, pipes of special form, or distributing mains or branches. It is also exclusive of the extension of the scheme to Kalgoorlie, some 40 miles beyond, which has since been decided on.

Thus, whatever the past of this sort of pipe may have been, it will, in its new form, start life with a commercial test of such severity as to settle its practical value beyond any question.

When I visited Meysham Ferguson's works in July last they had been in operation for nearly 12 months, and the industrial routine had attained its normal swing. The installation of the special machinery which had been designed and manufactured by the inventor in Australia is naturally of a very expensive class. This is merely on account of the great bulk of the pipes to be manufactured, and the necessity for the rapid handling of the awkward plates; for ¼-inch steel, some 4 feet wide and 28 feet long, has a tendency to wriggle itself into all sorts of shapes. Once installed, however, the manipulation of the machinery and the materials is simplicity itself.

The Factory.

This factory has no pretentions of beauty inside or out. It is made up of buildings of no particular design, roofed, and partially walled with galvanized iron, built onto a framing of equally unpretentious wood work. These buildings cover an arrangement of machinery which the owner admits might be improved upon in a new factory. As with the building, so with the machinery; it is rough looking, but serviceable. Yet, if these machines are rough, they are extremely ready, and it is Mr. Ferguson's boast that with them he could turn out a mile of 30-inch pipes in a day of two eight-hour shifts. At the time of my visit to his works he had not attained this ideal, which would mean 187 pipes, and he reckoned his average output to be about 100 pipes per day. He had, however, succeeded in turning out 54 in four hours, which, if kept up, would have meant 216 in the day. The two machines which are worthy of particular description here are, firstly, that used for reducing the plates to width and forming the dovetails on their edges; and, secondly, that which closes the joints of the formed up pipes.

The Machines.

To revert to the construction of the two special machines, which between them may be said to have solved the problem of the commercial value of this class of pipe, the planing and upsetting machine and the closing machine, these were patented by Mr. Ferguson on December 6, 1897. The former consists of a massive bed, on which the plate to be operated upon is firmly fixed. To this bed is fitted a proportionately substantial cross head or carrier, which travels in either direction on undercut slides along the full length of the bed. The motion is imparted to the carrier by a longitudinal screwed shaft; and, owing to the great length of this screw, and the heavy nature of the work it has to perform, a half speed screw, carrying a threaded bracket, is automatically and simultaneously brought into play. This bracket serves as a traveling support for the main screw, adjusting itself throughout its course to approximately half the distance between the carrier and the driven end of the screw shaft. There are two screw shafts and their attendant supporters, one on each side of the bed. The reversing of the carriage is effected by the ordinary open and cross belt system. The object of

this machine is to reduce the plates, already of an approximate width, to an exact, uniform width, and, further, to upset the edges in such a manner as to impart to them a dovetail form. The cutters which reduce the plate to width are fixed in two smaller carriers, which are attached one on each side of the main cross head or saddle, and travel with it. The upsetting rollers are fixed in the main saddle itself. The cutters precede the rollers in their work, and both cutters and rollers are set in progressive series, the first to operate being the furthest from the center line of the machine, and each successive one being slightly nearer that line. The heavy work falls on the earlier cutters and earlier rollers, the final ones being reserved for finishing off the work. There are sufficient cutters and rollers to complete the work on both sides of the plate in one passage of the saddle from end to end of the machine. The action of the horizontal upsetting rollers naturally tends to leave a slightly irregular or wavy line at the edges of the dovetail, and this is corrected by a pair of vertical rollers, set to thickness, between which the edges pass immediately on leaving the upsetting rollers. The severe nature of the work carried out by this machine entails powerful appliances for holding the plates in position while under operation. To effect this two strong girders are placed above the bed throughout its entire length. These girders are connected by cross pieces at intervals, and the framing thus made serves to carry four vertical hydraulic cylinders with rams acting downward. The two larger of these serve to effect the pressure and the two smaller ones to relieve it, lowering and lifting respectively the pressure pieces to which their lower ends are attached. The piece under operation lies on the bed with its edges slightly overhanging on each side, and the pressure apparatus is immediately above it, exerting its influence over the whole upper surface of the plate. A plate can be fixed and finished on this machine in less than five minutes.

Closing Machine.

The patent closing machine is a marvel of simplicity and ingenuity, and, to make its action clear in a few words, I would say that it treats the locking bar as if it were one long rivet, extending from one end of the pipe to the other, and closing it all along its course, inside and out, by hydraulic pressure. In this it differs from those machines in which there was an endeavor to make a tight joint in this class of pipe by means of exerting a pressure on each side of the seam. The pipes being made of two plates of equal widths, Fig. 3, the locking bars and joints are exactly opposite each other in the formed up pipe; thus both joints can be closed by pressure, or pressures, exerted in a straight line. The main portion of the machine consists in a rigid upright frame with horizontal bridge pieces or cross heads. In the lower portion of the frame, at its center, is a hydraulic cylinder with vertically acting ram, to the upper end of which is attached a closing tool, some 4 or 5 inches long, having in it a groove which conforms to the external shape of the closed locking bar. To facilitate an understanding of the working of the closing tools I append a diagram, Fig. 4,

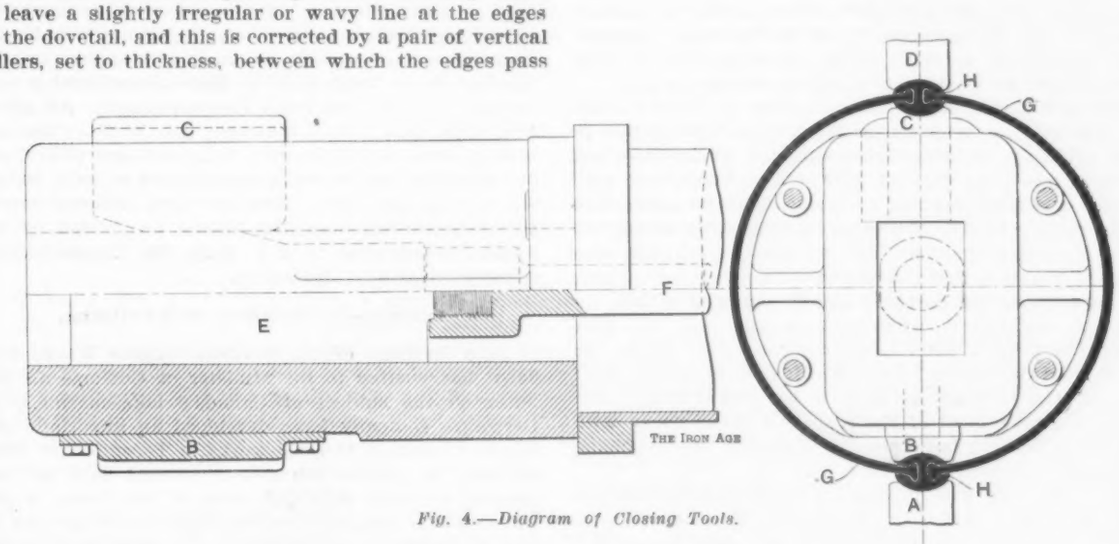


Fig. 3.—Joint Ring.

Fig. 4.—Diagram of Closing Tools.

MANUFACTURE OF LOCKING BAR PIPES IN WESTERN AUSTRALIA.

in which the one above referred to is marked A. Suspended from the upper bridge piece is a corresponding tool, fixed, and having no adjustment—an anvil, in fact, D. The pipe G G to be closed is passed between these two tools, with its seams so placed that a line drawn from one to the other would be vertical. When the pipe is presented the external surface of the lower locking bar rests on the closing tool A, and the external surface of the upper locking bar H is just under the fixed anvil D. Assuming that there were nothing to take the thrust inside the pipe, the effect of exerting pressure on the pipe in this position would be to crush it without closing any joint. The thrust is taken, and further hydraulic pressure exerted, on the internal surfaces of the joints by means of a mandrel attached to a rigid arm, the length of which is determined by the length of the pipe. Above and below this mandrel, at its extremity, are two closing tools, C and B, which find themselves between and in a direct vertical line with the two external tools A and D. In this case, however, it is the lower one, B, which is the fixed anvil, taking the thrust from the outside tool A; whereas the upper one, C, is an active closing tool brought into action vertically by means of a horizontal sliding block with an inclined upper surface, E. The thrust from this tool is taken by the anvil D. A connecting rod, F, effects the contact between E and a horizontal ram and cylinder, which forms part of the mandrel itself. After exerting a pressure, the vertical play of the closing tool C permits it to fall back, so that the pipe is no longer in the clutches of the tools, and the pipe can be fed further along into the machine.

With regard to the working pressure that these pipes will have to carry, the specifications for the pumping engines provide for a maximum head of water of 450 feet. Inferentially, therefore, we may assume that these pipes will have to convey water under such a pressure. The maximum pressure, however, does not occur over very long lengths, and the 5-16-inch pipes are provided

for the very heavy pressures. On four out of eight sections of the Coolgardie system the maximum water head is put at 260 feet.

These pipes will mostly be laid on or near the surface, and as they will have to submit to a variation of 75 degrees F., the test as to the practicability of the Ferguson joint as a permanent institution will be a very complete one. The joint rings between the lengths are of welded steel, and it has been recommended that a provision of ⅝ inch per 100 feet should be allowed for expansion and contraction.—*London Engineer.*

Canadian News.

Locomotive Works.

S. R. Callaway, president of the American Locomotive Company, was in Montreal some days ago, and had interviews with Sir William Van Horne and Sir Thomas Shaughnessy of the Canadian Pacific Railway Company, and with Chas. M. Hays of the Grand Trunk. He was interviewed as to the report that his company are considering the establishment of works in Canada. He said in reply to a direct question, "We should like to and probably will establish locomotive works here, but nothing has been decided yet." "You know," he continued, "it takes a lot of money to establish locomotive construction works. We have already spent $2,000,000 since the amalgamation. The machinery and plant were a good deal run down, and had to be renewed, so that at present we are devoting all our energies in that direction. Afterward, when we get time, we will look over the ground here." His company had orders, he said, from the Grand Trunk, Michigan Central and other roads. The tendency he finds to be toward large, powerful engines. Most of the roads are doing away with their smaller engines—breaking them up and replacing them with modern structures.

Canada just now presents a promising outlook for the locomotive industry. Depressed though that industry was for years, as shown by the long struggle and final failure of the old company at Kingston, it has more than it can do now. The Kingston Works are fully occupied with contracts, largely from the Government, and will be engaged on these for some time to come. Neither at the works of the Grand Trunk Company nor those of the Canadian Pacific are engines being turned out nearly fast enough to meet the demand kept up by the traffic on the two lines. The opening up of the division of the Canadian Northern from Port Arthur to Winnipeg adds another element to the demand. The Clergue roads, of which about 50 miles of the Algoma Central are now in operation, will also require engines. But it is mainly from the old lines that the call comes. The Canadian Pacific Railway had to transfer a large part of the power on its Ontario lines to those in the Northwest. Yet there was a great inadequacy of rolling stock of all kinds in the latter region as well as in the former. Not more than half of the big crop in the Northwest was got to the lake ports before the close of navigation. Now that the Canadian Northern is a system of between 1200 and 1300 miles, operating in a very productive country, there will probably be use for twice as many engines in the Northwest as there were in commission there last year. Further, of the 2000 engines that the Grand Trunk and Canadian Pacific roads are using very many are not of the large type required for the economic handling of traffic. The small engines will have to be replaced.

The business sent out of this country both by the Railway and Canals Department of the Dominion Government and by the leading railway companies must be to the American locomotive companies receiving the orders some indication of the demand that branches of their works on this side of the line would meet with. Many engines for the Government lines—those of the intercolonial system—have been purchased from American makers within the past few years. The Grand Trunk and the Canadian Pacific Railway have to go to the American market to supplement the output of their own shops. The Quebec and Lake St. John Railway Company have recently placed an order with the Baldwin Locomotive Works for 13 moguls, upon which delivery is to be begun next month. The duty of 35 per cent. ad valorem is an obstacle to this trade, and joined with the growing demand and the production of steel in Canada may well have an influence to induce American locomotive builders to establish branches in Canada.

An Ontario Government Railway.

The Ontario Legislature is now in session. An important measure introduced by the Government provides for the construction of a railway by the Government. The building and inauguration of the road will mark a departure in this province. In fact, none of the provinces have gone into railway building. All the railway mileage of Canada is under the control of companies, except the intercolonial system, which belongs to the Dominion Government. The projected Ontario road is much needed. It would extend northward from North Bay, a point where the Grand Trunk's line from the south intersects the main line of the Canadian Pacific. From North Bay the Government road is to be carried to a point on Lake Temiscamingue. All that is needed to bring this rich country into productiveness is railway service. There will be great agricultural and industrial developments in many parts of New Ontario once the railway belt is stretched out. Mineral wealth, of which the greatest part should be yielded by iron mines, is expected to flow from the Temiscamingue country when it is opened up.

Interests of Canadian Shipbuilding.

John Bertram of the Bertram Engine Works Company has written to the Minister of Customs an open letter on the subject of Canada's lake marine. Mr. Bertram's company have developed an important shipbuilding business at their works in Toronto. He points out that the marine interests of Canada have not been allowed to enjoy their full share of the fruits of good times in this country. Two or three years ago the Ontario Legislature passed a law requiring that all pine timber cut on the Crown lands must be manufactured into lumber in Canada, and nowhere else. This put an end to the large business that had been done in the towing of Canadian logs across Lake Huron to Michigan mills. But a new business sprang up in its stead. Since Ontario logs could be cut up in none but Canadian mills, a considerable number of these industrial establishments came into existence on the north shore. Several lumbermen, whose mills were in Michigan, but whose limits were in Canada, were forced to transfer their plants to this side of the line. Of course, the logs cut in the forest had to be assembled at the mills, and the contracts for towing logs from the mouths of the timber streams to lumber manufacturing centers at other points offered a good business to the owners of tugs. Thus the international towing that had been stopped by the Ontario Pine Manufacturing act gave place to a coast towing business. In the former both Canadian and American tugs had been free to take part, as the ports of departure and of destination were in different countries. The coasting laws of neither country applied. But to the towing business, as it is now conditioned, the coasting laws of Canada apply. They secure to Canadian tug owners a monopoly of the towing traffic. But, Mr. Bertram complains, the laws are not enforced. Consequently, he says, American tugs are taking part in the business the same as if it were solely in their own waters, or were still international. Mr. Bertram says:

"It is also well known that for years American tugs have been allowed to do work on the Canadian side of the river at Sarnia, and, further, at least one tug while under United States registry obtained quite recently from a British Consul resident at an American port a certificate of some kind, allowing it to tow logs in Canadian waters, contrary to the provisions of the coasting regulations."

He points out that business has been lost to Canadian shipbuilders because of this relaxation of the law. One case he mentions where negotiations for the building of a tug of the most powerful type on the lakes

fell through because of the participation of American tugs in the coast towing trade.

"At the present time, if assured that no interference by American tugs would be tolerated, the construction of powerful Canadian tugs, fully equipped for towing logs, would at once commence, but until this assurance is given there is little inducement for any one to invest in that class of property."

He calls the attention of the Minister to other disadvantages that Canadian steel shipbuilders labor under. One is the fact that British built vessels, fully equipped, come in here free of duty, while Canadian shipbuilders have to pay duties on the materials they import. The small amount of drawback allowed per registered ton does not serve to equalize conditions. "Were it not that a design and type of vessel better suited for inland waters has been evolved here with a larger and more econominal carrying capacity per ton of displacement than anything built on the Clyde, the Canadian shipyards would not be in the competition."

A third unfavorable condition to which Mr. Bertram draws attention is the comparatively small hindrance to the admission of foreign built vessels to register. On the payment of a duty of 10 per cent. of the value of their hulls and 25 per cent. of the value of their machinery they are allowed to enter. If the entry were confined to new vessels only and the duty assessed on the American selling price the rates would probably be effective. But "as a matter of fact, entries have been confined to old boats, difficult to value, and so the duty collected has been only nominal in amount. So with British boats free, American boats at a nominal valuation, their freighters occasionally granted a permit to share in our coasting trade, and their tugs, within or without the terms of our regulations, coming here to share in our coasting work, it is a wonder that any new vessels are built in Ontario to ply in international waters."

Mr. Bertram, who is an influential supporter of the Government he addresses, concludes with these suggestions:

"1. Canadian shipbuilders should be placed on a footing of equality with British shipbuilders. How this should be done is within the purview of the policy of the present Government. A beginning has been made already by granting a small drawback on new tonnage, and it only requires to go a step further and make it such an amount as would equalize conditions between shipbuilders here and in Great Britain. 2. There seems no other way of stopping our sharp and ingenious friends on the other side of the lakes from having us at a disadvantage except by strictly carrying out our own law with regard to coasting regulations; and, further, by taking a leaf out of their own book and forbidding the registration of any American built vessel in a Canadian port. This may, to some people, seem drastic, but it cannot be considered unfriendly, as it simply follows their own example."

Minor Notes.

Owing to the famine in coke, the McClary Mfg. Company, London, Ontario, have not yet started up the works in Hamilton that they purchased from the Copp Bros.' Estate. The foundry may be started in a short time, however, if the necessary fuel can be got.

Some of the men employed by M. Moody & Sons, manufacturers of farm implements, Montreal, have been on strike. A few nights ago a number of them broke into the works and did some damage to the machinery. Five have been arrested, and are to be tried next month.

The Department of Agriculture at Ottawa, which is shipping supplies to South Africa, has notified all concerned that it is prepared to carry merchandise for private exporters at a low freight rate, having a limited amount of space available. About seven shiploads of supplies are sent out every month. It is thought that by availing themselves of this opportunity, Canadian manufacturers may lay the foundations of a big trade with South Africa.

The large works of the John Abell Company in Toronto are to be taken hold of by a new group of capitalists and utilized to their full capacity. John Abell's name has been before the public for nearly half a century, and in that time a great amount of agricultural machinery has been turned out in his factories. Latterly the business has been confined principally to threshing machines. With an infusion of new enterprise and capital the business should become prosperous, as the demand for threshing machines on Western account is now ahead of the supply.

It is reported that the Canadian Copper Company contemplate the establishment of a refinery at Copper Cliff.

F. H. Clergue has notified the Department of Railways and Canals that the Algoma Steel Company will commence turning out steel rails next month. The capacity of the mill, he says, is 1000 rails per day, and the materials necessary for the production of 50,000 tons are now in stock. The company's contract with the Government is for the supply of 25,000 tons. Delivery was to have been begun last year. It is known that the Government, failing to get rails in time from Mr. Clergue's works, purchased 15,000 tons in England, the contractors being Charles Cammell & Sons and the Barrow Hematite Company.

At Mille Roches, about 5 miles from Cornwall, Ontario, a new electric plant has been installed. The power is generated by a revolving field alternating current machine equal to 1300 horse-power. It is the first of the kind introduced in Canada, and comes from the Bullock Mfg. Company, Cincinnati. Provision is made in the power house for three more such machines.

C. A. C. J.

Larger Sheet Metal Working Machines.

A marked development in the sheet metal trade of recent years has been the demand for machinery adapted to the handling of larger work than formerly. In the line of cornice machines, for example, the manufacturers of sheet metal machinery note a very pronounced change. Some 15 years ago the longest machine made for bending galvanized iron was 6 feet; subsequently inquiries were occasionally received for machines 8 feet long. A leading firm of sheet metal machinery manufacturers in the Central West consulted at that time with cornicemen as to the advisability of getting up patterns for a machine of that length. They were met with the objection that a cornice brake 8 feet long was impracticable, and were advised against going to the expense of getting up patterns for such a tool. As the inquiries for a longer machine kept coming in, however, the firm at length decided to get up a set of patterns for one, and they occasionally found a corniceman sufficiently progressive to buy an 8-foot machine. The market, however, is now so changed that the firm in question say that where they formerly sold ten 6-foot brakes to one 8-foot they now sell 20 8-foot brakes to one of 6-foot. Moreover, they are now getting inquiries for 10-foot machines, and have recently gotten up 10-foot patterns, believing that in the near future the demand for 10-foot cornice brakes will be as much greater than that for 8-foot brakes as the demand for 8-foot brakes now exceeds that for the 6-foot machines. As before, when proposing to increase the length of their machine, many cornicemen now declare that 10-foot galvanized iron cannot be handled properly, and that a 10-foot cornice brake will never be a success. The firm, however, are satisfied, from their former experience, that they are on the right track, and that in turning out a 10-foot brake they will meet the demands of modern requirements. The manufacturers of sheet iron have begun to manufacture longer and wider sheets and the tools to work these sheets must necessarily be increased in size and capacity in correspondence. The manufacturers referred to had a similar experience with their corrugating machine, used for corrugating roofing and siding for buildings. When they first began to manufacture these tools the demand was for 10-foot machines, and roofers declared that that was as long as they ought to be made, as a longer machine would not work properly. However, the manufacturers got up a 12-foot machine, and state that at the present time most of the orders received for these tools are for those of the longer length.

The Lindsay Reversing Gear for Rolling Mills.

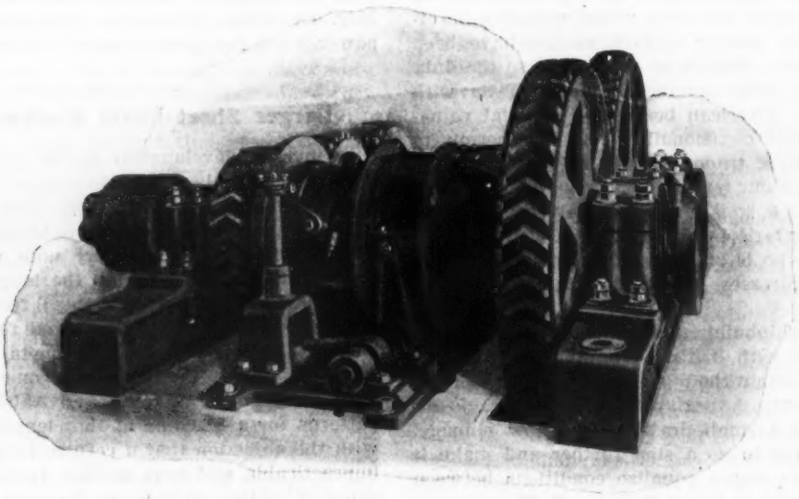
It is well known that if a rope be made fast at one end, and be wound three or four times around a rotating shaft, it makes a most effectual brake, provided the shaft be running in the direction to tighten the convolutions. A slight pull applied to the tail of the rope is multiplied several times by each turn, until a very intense pressure is attained. It is on this phenomenon that Lindsay's clutch, manufactured by the Coil Clutch Mfg. Company of 45 Broadway, New York, is founded. For the rope coil there is substituted, however, a helix of square steel, so arranged that the tail end may be made to grip or release the rotating shaft at will. If one end of such a helix be attached to a pulley, and the other end be made to grasp the shaft, motion can be conveyed from the one to the other by reason of the frictional grip of the helix on the shaft. If the parts be properly proportioned it is possible to throw such a clutch into gear absolutely without shock, sufficient slip taking place to render the start quite easy, while at the same time it is absolutely certain.

So much for the principle. In practice these clutches are made in several forms, and in very many sizes. Up till recently a friction clutch to transmit 500 horse-power at the ordinary speeds of shafting was a serious and expensive undertaking, but these clutches are now being made of sufficient size to transmit many thousands of horse-power. Even the largest size can be manipulated by a boy, and in no case is there any appreciable end thrust on the shaft. All that is required to effect engagement is to bring the end or point of the helix into frictional engagement with the shaft, or with a sleeve upon the shaft, and then the successive convolutions tighten themselves up until a most intense grip is attained. As a matter of fact, this grip is too great to be imposed on a soft iron or steel shaft, and is always taken on a chilled cast iron sleeve upon the shaft. This sleeve is ground to a fine surface and does not suffer from wear. In some cases it is taper, and a taper coil is thrust up it. In this form it is easy to render the engagement most gradual, and so to graduate the friction on the point of the coil that the clutch will slip should a determined strain be exceeded. To effect disengagement the coil is drawn down the cone, the force required to do this being exceedingly small, since it is applied to the last coil, which has only a comparatively slight grip. As soon as this loses its grip all the others release themselves at once. Clutches of this kind are used for coupling shafts together, for driving pulleys at exceedingly high speeds and for the gearing of oil launches and motor cars. For the last purpose the coil clutch is particularly suitable, since the engagement may be made gradually—a most important feature.

In another type of coil clutch the sleeve is turned parallel and the coil bored very slightly larger. One end of the coil is made fast to the wheel or pulley to be driven, while the other is turned outward. If a collar carrying a taper finger be moved along the shaft and against the turned up end of the coil it will wind up the coil slightly and cause it to grip the sleeve and drive the wheel or pulley. These are intended for clutches of the greatest powers, such as the clutches for 2000 horse-power, as illustrated.

These reversing clutches have been constructed for Krupp's, at Essen, Germany; the Volga Vischera Works, Moscow; Le Forge de Champagne, Montlucon, France, where the heaviest armor plate is being rolled, and in very many plate and bar mills in England and on the Continent. A recent construction for the Volga Vischera Works was one of 10,000 horse-power. One of 500 horse-power is now in operation at the Seamless Tube Works, Ellwood, Pa.

Fig. 1 shows the arrangement in perspective; Fig. 2 is a sectional elevation; Fig. 3 is a plan. One end of the shaft, Fig. 2, is driven from the engine, and is made in two parts, the division occurring between the first pinion and the corresponding clutch. The second part



THE LINDSAY REVERSING GEAR FOR ROLLING MILLS.

of the shaft is supported by being turned down and fitted into a recess bored into the first part of the shaft. This recess is bushed with gun metal. At the far end of the second part of the shaft is a wabbler for connection to the rolling mill.

The two shafts are connected, Fig. 3, by two trains of gearing, one containing two and the other three wheels. When the mill is driven in one direction the power is transmitted through these five wheels, and when it is driven in the other the two parts of the shaft are rigidly connected and the wheels run idly. The last wheel is bushed with gun metal, so that the eye may not be worn when running in the opposite direction to the shaft on which it stands. The necessary changes to obtain reversal in either direction are made by means of two clutches. The coil of the first is rigidly connected at one end to the small pinion. This pinion is keyed to its shaft. The coil is wound around a chilled sleeve keyed to the other part of the shaft, in such a direction that it tends to tighten itself when any drag is put on the point of the coil to give an initial grip. When this clutch holds the two parts of the shaft become connected, and the power is transmitted directly from one to the other, the wheels running idly. The second clutch coil is connected to the last wheel of the train, and is wound around a sleeve keyed on the second part of the shaft. When it grips the sleeve, the first clutch being loose, the two ends of the wheel train are connected to the two parts of the shaft, which then run in opposite directions.

The two clutches are manipulated by a screw, Figs.

1 and 3, which operates a bell crank lever. This lever slides a double faced disk along the shaft, and presses either face against the lever which tightens the corresponding coil. This device is not very clearly shown in the engravings, but it may be readily understood. A small lever is pivoted on a stud carried from the boss of the toothed wheel and its end projects so that the sliding disk operated by the clutch lever can be pressed against it. When this is done a projection of the lever comes against an adjustable stop on the end of the coil and slightly tightens its convolutions. The smallest movement causes the coil to wind itself up and obtain a grip on the chilled boss or sleeve on which it is wound of such exceeding tightness that it will transmit thousands of horse-power. So complete is the control exercised by the starting gear that the clutches can be started quite gradually and if desirable permitted to slip, and they can also be stopped and started with the full working load on as easily as when empty.

The coils are forged from steel bars, gradually tapering toward the point, and are wound into helices. The varying section supplies the strength of the part where it is needed, and renders the coil more elastic and delicate in action. So sensitive is it that a very small boy can, and does, manage a rolling mill, reversing it several times a minute, and without putting more than the minutest amount of end friction on the clutch disk. Immediately the pressure is released from a coil it liberates itself with absolute certainty, while the moment it is pressed it takes up its work without noise or shock. The clutch bosses or sleeves are of deeply chilled cast iron, ground to a fine surface. Naturally there is an enormous pressure on them, and it is for this reason that they are made as hard as possible.

As an evidence of the extreme delicacy of coil clutches, the fact may be mentioned that the same coil will act both as a clutch and as a brake. For instance, if such a clutch be fitted to a winding drum or hoist,

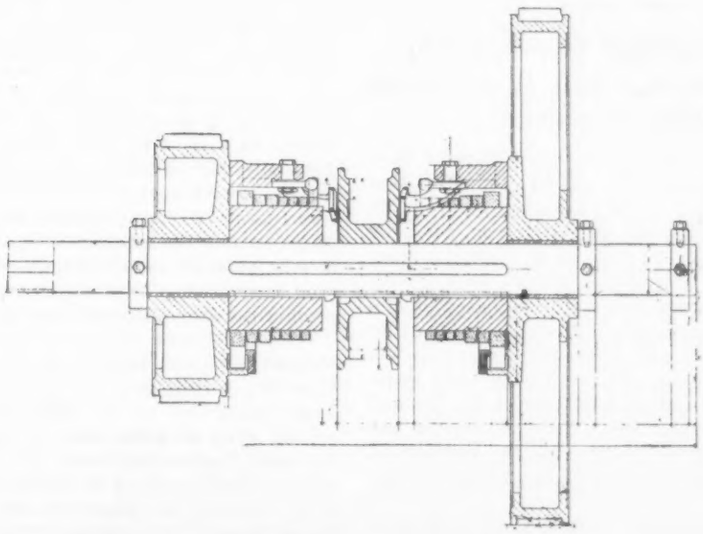


Fig. 2.—Sectional Elevation.

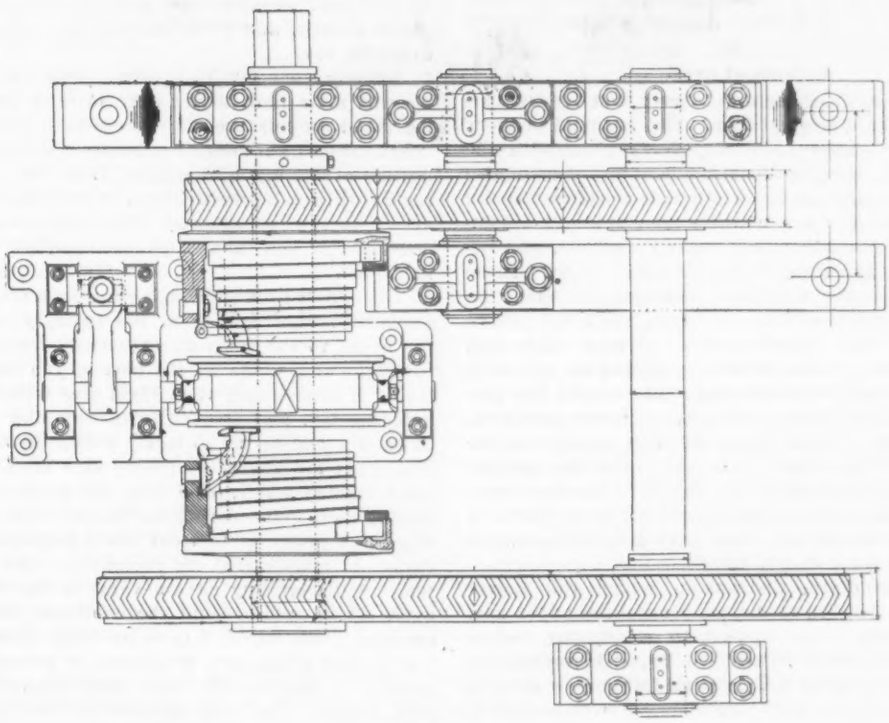


Fig. 3.—Plan.

THE LINDSAY REVERSING GEAR FOR ROLLING MILLS.

the load may be held stationary in mid-air without stopping the engine, the friction between the coil and the sleeve being so readily graduated that the load neither runs up or down. If the hoist is to be driven both ways by power, then a double acting coil is fitted, consisting of a coil with a central head and with right and left handed convolutions on either side, and the load may be held either in ascending or descending.

The Lake Superior Ore Region.

The Report of C. R. Van Hise of the United States Geological Survey.

WASHINGTON, D. C., January 21, 1902.—Reports have been current during the past fortnight to the effect that an expert of the United States Geological Survey has prepared an official statement embodying an estimate indicating that the supply of iron ore in the Lake Superior region is in danger of exhaustion at a comparatively early date. The rumors are believed to be based upon a somewhat inaccurate understanding of the contents of the forthcoming annual report of the Survey, which will contain a monograph on the iron ores of the Lake Superior region by C. R. Van Hise, and to meet the demand for information on the subject a joint resolution has been presented to Congress authorizing the publication of a special edition of 4000 copies of this feature of the report.

Mr. Van Hise's statement concerning the extent of the ore deposits does not bear out the rather sensational reports in circulation, but he goes so far as to declare that the exhaustibility of high grade ores in the Lake Superior region cannot be too strongly insisted upon. With regard to the genesis of the ores and the quantity available, he says:

Genesis of Ores.

As to the genesis of the ores, cherty iron bearing carbonate is the main original rock. This is found in every district of the entire Lake Superior region, with the exception of the Mesaba district, where iron silicate also is very important. The rocks are metamorphosed along two main lines. The first of these lines produces amphibolitic and magnetitic quartz rocks or schists, and occasionally also pyroxenitic and chrysolitic rocks. These rocks develop under deep sea conditions in connection with igneous intrusives, and especially the basal gabbro intrusives of the Keweenawan. Where the iron bearing formations have thus been altered no workable ore bodies have as yet been found. The second line produces ferruginous slates, ferruginous cherts, jaspilites, and ore bodies. These rocks develop mainly in the belt of weathering, although in many cases the production of the jaspers required two stages—first, the formation of the ferruginous slates and ferruginous cherts in the belt of the weathering, and later dehydration when the formations were deeply buried.

In a number of the districts in which the Lower Huronian iron bearing formation occurs the upper part of the formation was exposed to weathering before Upper Huronian time. When the Upper Huronian sea transgressed over these iron bearing formations detrital ferruginous sandstone and conglomerate were produced, which, so far as they contain iron oxide, are on their way toward ore bodies. To some extent, also, the ore bodies are due to the oxidation of the iron carbonate in place. But all of the facts irresistibly lead to the conclusion that the final and most important step in the production of the ore bodies was secondary enrichment by downward percolating waters below crests or slopes where such waters were converged by the pitching troughs. The waters which followed the more circuitous routes transported iron carbonate; waters more directly from the surface, which did not pass through iron carbonate, bore oxygen; the two kinds of solutions mingled and precipitated iron oxide. The waters ascended and escaped below the valleys. Finally, the great quantity of water which was converged in these troughs and moved downward abstracted the silica and carried it elsewhere.

Quantity of Ore Available.

If the foregoing reasoning be correct, it is perfectly clear that the ore bodies cannot be expected to extend beyond the depth to which the descending waters may bear oxygen and precipitate iron oxide. Up to the present time all but an insignificant fraction of the ore has been taken above the 1000-foot level. Many ore deposits before reaching the depth of 1000 feet have become smaller and poorer, and a number have been worked out. Two or three ore deposits have been sufficiently persistent so that they have been worked to the depth of 1500 feet, but the great majority of deposits, even in the older districts, in which there has been time for deep development, has not been worked to such depths as this. I have no doubt that vastly more high grade ore will be taken out in the Lake Superior region above the 1000-foot level than below it. If this be true iron ores of the Lake Superior region bearing more than 60 per cent. of metallic iron are not inexhaustible. Indeed, a very appreciable percentage of such ores yet discovered has already been exploited. But high grade ores are not the only source of supply.

Thirteen years ago practically all of the material shipped from the Lake Superior region contained more than 60 per cent. metallic iron. For the last five years large quantities of ore have been shipped from the ranges south of Lake Superior containing less than 60 per cent., and considerable quantities of ore have been shipped running from 40 to 50 per cent. metallic iron. If all material be called iron ore in which the percentage of iron is 50 per cent. or more, with an average amount of phosphorus, a large quantity of material left behind, wasted or not developed at all, would be ore. If material be called iron ore which runs more than 40 per cent. metallic iron, and this material would be ore in Europe, this would add greatly to the quantity of available ore.

Already some low phosphorus, high silica ores which bear no more than 40 per cent. metallic iron have been marketed for mixture with the Mesaba ores. I have no doubt that within another generation a considerable proportion of the material shipped from the Lake Superior region will run between 40 and 50 per cent. metallic iron, and that low phosphorus, high silica ores containing considerably less than 40 per cent. metallic iron will be marketed.

The exhaustibility of high grade iron ores in the Lake Superior region cannot be too strongly insisted upon, for belief to the contrary invariably results in lack of foresight and waste on the part of the operators. The policy of mining only the richest ores which can be marketed to-day, and frequently in handling this material in such a manner as to make it difficult to recover the somewhat lower grade material at a later date, is very short sighted policy, even from the point of view of the mining men, and ignoring the future of the nation. The sagacious policy is to treat the low grade ores which cannot be marketed at the present moment as a resource which will certainly have a value in the future. Moreover, taking into account the enormous increase in the amount of ore mined, I have no doubt that the demand for the low grade ores, which are at present completely ignored or wasted, will come much sooner than mining men believe. The total product of the Lake Superior region since mining began in 1850 to 1900, inclusive, is 171,418,984 long tons. The amount mined in the decade between 1891 and 1900, inclusive, is 114,017,546 long tons, or 66.5 per cent., or nearly seven-tenths, of the total amount mined. The product for the year 1900 surpasses that of any previous year and is one-ninth of the aggregate of this and all preceding years. It is certain that the product of the current decade will far surpass that of the last decade.

The mining men should seriously consider how many decades' supply such as that of 1891 to 1900 of high grade materials is in sight, or even discoverable, on the United States side of the boundary. If this amount be placed at 1,000,000,000 long tons, mining at the rate of 20,000,000 tons per year would exhaust the supply in the first half of the twentieth century, or in about the same length of time that mining has been carried on in the

Lake Superior region. The exhaustion within a few decades of the high grade ores of the Lake Superior region now discovered is little short of a certainty. It is therefore plain that the material in which the percentage of iron is below the present market demand, and which must be handled in connection with present operations, should be stock piled, and that the mines be developed and exploited with the expectation in a comparatively short time of mining material running between 50 and 60 per cent. of metallic iron, and within a comparatively few decades of material running between 40 and 50 per cent. metallic iron. W. L. C.

The Department of Commerce.

WASHINGTON, D. C., January 21, 1902.—Excellent progress has been made during the past week by the advocates of the establishment of a department of commerce, for which a bill was unanimously reported from the Senate Committee on Commerce on the 9th inst. Senator Nelson, the author of the measure, has called it up for consideration in the Senate on two occasions, and its provisions have been discussed at considerable length. Although it was developed that the Senate desires to devote a great deal of time to so important a matter, the discussion of the bill brought out the fact that it has the hearty support of such administration men as Vice-President Frye, and Senators Lodge and Cullom, and it is also supported by leading members of the minority.

In explaining the provisions of the bill to the Senate Mr. Nelson dwelt with great emphasis upon the importance not only of placing the stupendous commercial interests of the country in the hands of a well equipped executive department, but also of making it the duty of one great department to seek the extension of our foreign trade to enable American producers to market their constantly increasing surplus.

"There is among our executive departments," said Senator Nelson, "no department that stands charged with the care, promotion and development of our vast commercial, manufacturing, mining and other industrial enterprises. The agricultural interests of the country are well cared for by the Agricultural Department, but the other great industries, as well as our enormous commerce, are without any direct Governmental guidance and assistance. These vast interests of our people—the great throbbings of our economic and industrial life—have no Governmental head, direction or guidance, but are left to shift for themselves without any system, harmony or unity of action so essential to thorough and permanent progress. Such a condition is not only hampering in dealing with ourselves, but is much more embarrassing, retarding and injurious when we come to compete with other nations in the field of the world's traffic and commerce. To enter the markets of foreign countries effectively and systematically we must thoroughly familiarize ourselves with the laws, trade conditions, resources and wants of those countries. This can only be done systematically and effectively through an organ of our Government charged with such task—the gathering and dissemination of the necessary information."

Continuing, Senator Nelson said that the necessity for increasing the foreign outlet of our commerce was today more urgent than ever before in the history of the country. Our productive capacity, pressed by an abundance of capital, labor and raw material, far exceeds our own wants, and will so continue with increased force and persistence that the great problem is, and will continue to be, to secure and hold greater and more extensive markets abroad.

"Without greater markets abroad," he said, "industrial stagnation and congestion, superinduced by too rapid production, are liable at any time to set in and produce a reaction that will be demoralizing, damaging and destructive to all classes of our people, and will not only bring an economic convulsion, but will also raise serious social problems difficult to meet and adjust. There is therefore an urgent demand for a department of commerce to act as an intermediary and support for the American people in meeting and solving these problems."

It will be noted that Senator Nelson regards the function of the proposed new department as being directly in line with the object which is sought to be accomplished through the negotiation of reciprocity treaties, of which he is also a very strong advocate. In his opinion, the leading countries of Europe have secured a very important advantage over the United States in that they have negotiated with each other reciprocity agreements on mutually satisfactory terms, under which they enjoy the minimum rates of each other's tariffs, while the United States in the majority of cases pays the maximum tariffs of its leading European customers. The reciprocal advantages secured by European countries, Mr. Nelson thinks, have been largely the work of special departments similar to that which he proposes to establish here.

"All the other countries of the world, great and small," said Senator Nelson, "have, with few exceptions, felt the need of such a Governmental organ, and have in substance such a department as is contemplated in this bill. Without the help of such a department we will not be on a footing of equality, and will, in many respects, as against our commercial and industrial rivals, be handicapped and at great disadvantage."

During the discussion that followed Senator Nelson's remarks it appeared that Sentor Teller, at one time Secretary of the Interior, desired more time in which to examine the details of the bill, and a similar intimation was given by Senator Hale of Maine. Senator Nelson, therefore, moved that the bill go over without losing its place on the calendar, and this was agreed to. Senator Lodge took occasion to say that he was very strongly in favor of the measure, which he believed to be eminently desirable. He added that it would be decidedly in the interest of good administration to bring under one head all the bureaus relating to industrial and commercial matters, and he said he hoped that Senator Nelson would press the bill vigorously before the Senate became absorbed with other matters.

Pursuant to Senator Lodge's suggestion Sentor Nelson again called up the bill later in the week, and it was laid before the Senate for the purpose of amendment. In the debate that followed it became apparent that the heads of the various existing departments were prepared, through certain Senators, to suggest modifications in the general scheme transferring certain bureaus to the new department. This was anticipated by Senator Nelson, and where good reasons were shown why bureaus should remain under present control amendments providing therefor were accepted. Senator Hale called attention to the importance of the measure, saying that it provided a larger and more important department than any now existing, and a new secretary with more comprehensive duties than any other Cabinet officer. Under the circumstances he suggested that further debate be postponed until statistics could be prepared showing the desirability of transferring the various surveys to other departments than the new one provided by the pending bill. Senator Platt of Connecticut also suggested that a transfer of the Patent Office from the Interior Department, with which it has become correlated and adjusted, would be a serious and delicate operation, and as chairman of the Committee on Patents he asked for additional time to look into the matter. Senator Nelson readily agreed to postpone the consideration of the bill for a few days, and it thereupon went over without losing its place on the Senate calendar. W. L. C.

The Wire Rod Record.—The No. 2 rod mill at the Joliet Works of the Illinois Steel Company still holds the world's record for the production of No. 5 wire rods produced in a 12-hour turn. This mill on the day turn January 11 attained a product of 252 tons and 900 pounds

Schulman & Garber, who have been established in Minneapolis since 1884 as dealers in scrap iron and metals, have removed from 1328 Washington avenue, North, to 329 Tenth avenue, South, where they have larger quarters. They state that they will be able to handle heavy iron, &c., because they have shears and drop to break and cut it up.

Americans Push Work in England.

A very interesting statement appears in a recent issue of the Chicago *Evening Post*, furnished by a London correspondent of that paper. The correspondent alludes to the general indisposition of the British workmen to work, and in this connection gives a spicy account of the manner in which the construction of the new buildings of the Westinghouse Company at Manchester, England, has been pushed. It appears that when the Westinghouse Company decided to place contracts for these buildings, they assembled a number of British builders and, placing before them the plans, inquired how soon the construction could be accomplished. It was declared that by getting up early in the morning and going to bed late at night some thousands of British workmen could probably finish the job in five years. The correspondent says "the Westinghouse Company then coughed very loud and said 'Ah,' and were very sorrowful for a time," until they sent to America and got J. C. Stewart of St. Louis to go over as building manager. The remainder of the account can be put in the correspondent's own words, as follows:

Mr. Stewart brought ten Americans with him, and he got together 2060 men of Britain and he asked them how many bricks each one of them could lay a day and each man answered promptly:

"Four hundred and fifty, sir!"

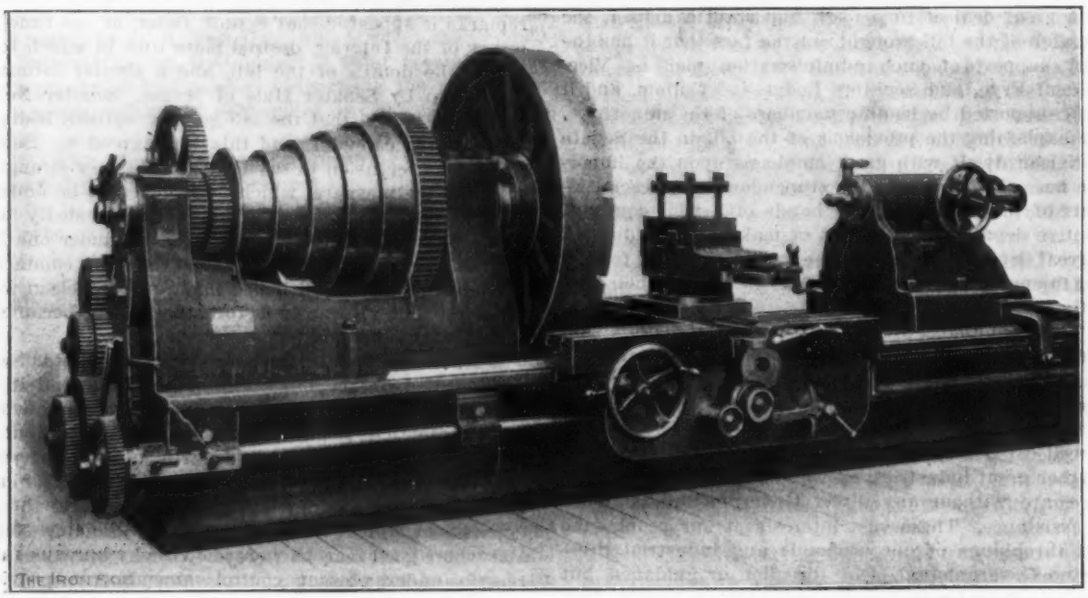
Mr. Stewart passed his hand over his eyes and mouth that the men of Britain might not see him smile, and he told them to get to work, and he put bees in the bonnets of the various foremen in the shape of presents of ten guinea suits of clothes, to induce the workmen to work, and in two weeks the British workmen were each laying 900 bricks a day. But that would never do, so they were induced to work faster, and were given 11 pence instead of 10 pence an hour, and a few weeks ago they were laying 1800 bricks a day of nine hours, and this first year sees the completion of the buildings which it was said it would take five years to build!

Can the British workman work, do you ask? It seems he can if he has an American "boss" to make him! All England is jubilant over the result, except the rest of the English workmen who were not employed on the Westinghouse buildings. They are feeling very dubious and fearful and tearful, and are wondering if they, too, are going to be taken in hand by American "bosses" and made to quit not working and start a working for a living.

The Belfont Iron Works.—The directors of the Belfont Iron Works Company, Ironton, Ohio, have declared for their company a cash dividend of 15 per cent. on a capital stock of $625,000, the same being payable February 1. They also elected B. H. Burr president and general manager, succeeding John C. Peebles, former president. Robert Peebles was elected vice-president. S. G. Gillfillan was elected a member of the Board of Directors to succeed John C. Peebles, deceased. S. G. Gillfillan was also elected one of the directors of the Ashland Steel Company, succeeding John C. Peebles as a member of that board. They furthermore took the preliminary steps toward building a new blast furnace alongside of their present furnace.

New Pittsburgh Lathe and Boring Machine.

The Pittsburgh Machine Tool Company of Allegheny, Pa., have recently designed and built two machines containing several new features. The 50-inch lathe is triple geared and is of an exceedingly stiff design. The main spindle is of 60 carbon crucible steel, accurately ground, and runs in scraped bronze bearings. The lathe is furnished with steel driving pinions, and for extra heavy duty the face plate is also made of steel.



THE NEW PITTSBURGH 50-INCH LATHE.

The screw cutting mechanism is also built for very heavy duty, the gearing being of very wide face and of as coarse pitch as possible. There are two feeds and two leads that can be had with one change of gearing in the head stock. The lead screws are made of 40 carbon crucible steel, are of ample size and, being of exceptionally hard material, they will last almost indefinitely. The apron gears are nearly all steel and bronze. In the front of the apron there is a patent device for the prevention of throwing in two feeds together—that is, it is impossible to throw in the screw feed and lateral feed at the same time. This is acomplished by a lever which operates the lateral feed and which projects in the shape of a quadrant. This quadrant has a half-round recess milled out in its edge in the center, the recess being the same size as the collar on the shear nut stud. The shear nut stud collar is also milled off at the same radius as the outside of the quadrant. When the shear nut is not in use the milled off portion of the collar on the shear nut stud comes into such a position as to allow the quadrant on the lateral feed gear handle to pass by it, thus allowing the lateral feed motion to be thrown in. When the lateral feed is thrown in it is impossible to throw the shear nut handle down, as it is impossible to turn the collar against the quadrant. The threads on the lead screw are not used when turning, the lateral feed being operated by a sliding key in a spline in the lead screw. The studs in the apron are

hardened and ground. All gears on the quadrant are bushed with bronze. The carriage has a very long bearing on the shears and the compound is also built for heavy work. The tail stock is moved along the bed by a gearing and has an ample bearing. The tail spindle is operated by a hand wheel at the side of the tail stock. All flat surfaces are scraped to a fit and all slides are supplied with bronze wedge gibs for taking up lost motion. The lathe is guaranteed to bore true and face square within 0.001 inch in 1 foot.

Car Brass Boring Machine.

The car brass boring machine, Fig. 2, has two carriages and two boring bars in operation at the same time. The bars are driven from the head and are thrown out of and in motion by means of a clutch located at the head. The lead screws for feeding the carriages are located directly under the carriages, and they are driven by steel gearing from the head end of the machine. The chucks on the machine are made to raise and lower with a cam attachment so as to get the proper amount of adjustment necessary. With this machine a 9-inch car brass has been bored in 30 seconds actual cutting time.

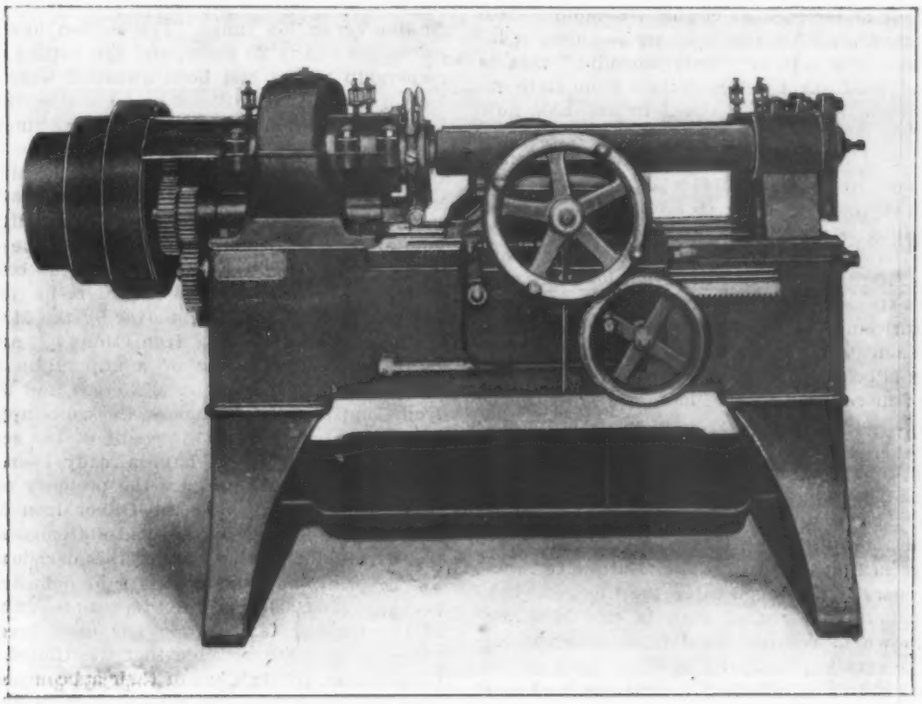


Fig. 2.

THE NEW PITTSBURGH CAR BRASS BORING MACHINE.

The Block-Pollak Iron Company, Chicago, have bought the Mississippi & Little Rock Railroad, consisting of 27½ miles of rail and grade. The road lies in Lonoke and Prairie counties, Arkansas, and is part of a line originally intended to be built from Little Rock to the Mississippi River, but was placed in the hands of a receiver some years since. It has never been operated. The property was ordered to be sold last June and several dates have since been named for the sale, but definite action in this direction was not taken until the 15th inst. A large number of bidders were present at the sale, among them being several scrap iron dealers, and the price was run up to $20,100. The property comprises the track and graded roadbed, one locomotive, several builders' cars and switch stands. The total investment up to the time the road went into the receiver's hands was $240,000. The Block-Pollak Iron Company had furnished no material to the road, but bought it as an investment and have not yet decided what they will do with the property.

Illinois Coke Developments.

The Universal Fuel Company, Chicago, have purchased 5000 to 6000 acres of coal land in Southern Illinois, and will shortly erect 1000 coke ovens on the property, expecting to produce about 750,000 tons of coke per annum. This is the company of which L. Z and Joseph Leiter are the backers. It will be remembered that some months since the Illionis Steel Company made a furnace test at their Union Works of the coke produced by the process controlled by the Universal Fuel Company. Some 2000 tons of Illinois coke, made in the company's experimental ovens near the Union Works, were exclusively used in the furnace test, which continued five days. The results were so satisfactory that the Universal Fuel Company determined to develop their process on a large scale. It has been found that the extraction of by-products from Illinois coal was accomplished at the expense of the quality of the coke, and therefore no attempt will be made to save the by-products. Therefore it will be more economical to locate the ovens at the coal mines, and thus save the excess freight on the coal in transporting the fuel to market. The Messrs. Leiter have been assiduous in endeavoring to perfect a process for successfully producing coke from native Illinois coal, and have spared no expense in conducting the necessary experiments. Their decision to locate a large coking plant is quite conclusive evidence that they are satisfied with the results which have been accomplished.

The Juniata Tin Plate Company.—The Juniata Tin Plate Company, capitalized at $250,000, will build a black plate mill and tin plate factory at Greencastle, Ind. F. M. Strong, for several years manager of the Elwood plant of the American Tin Plate Company, has resigned that position to take charge of the new company. Associated with him are Samuel Lewis, William H. Richards, J. H. Selberling and H. M. Strong.

A New Steel Plant at Joliet.—John Lambert of Joliet, Ill., former president of the American Steel & Wire Company, is interested in a new steel plant to be built at Joliet, but will not disclose its nature at present. He says it is to be a large undertaking and will be of great benefit to Joliet.

Lake Mining Matters.

Activity in Explorations.

DULUTH, MINN., January 18, 1902.—Exploring for iron on the Mesaba range is being carried on with more activity than ever. One exploring firm working on that range alone now have a force of 205 men with some 45 to 50 drills in operation. There is a constant call for additional drills, and if they could be furnished many more would be set at work immediately. Conditions are such that the exploring contractors will not buy additional drills, but demand that those wishing work done shall provide their own machines, which is having the effect of curtailing the new work to some extent. Prices for drilling have recently advanced and now vary from $2.75 to more than $6 a foot, according to the material, the character of the drill and the depth. Work on the Mesaba is of a different character from a few years ago and what would have then been called thorough exploring is not so regarded now. Not only has it been abundantly proved that ore is to be found oftentimes under a considerable thickness of taconite, but under slate as well, or under rock so closely resembling slate as to be mistaken for it by any ordinary methods of inspection. There is a sort of "slaty taconite" that is almost impossible of exact differentiation from slate except perhaps by a microscopic slide. In one hole now being sunk near Hibbing some excellent ore, good in both physical and chemical character, has been found under 75 feet of it. A deep surface is no longer such a deterrent agent as formerly. In section 16, T. 56, R. 23, where drilling is now under way, ore to the thickness of more than 100 feet has been found under a surface of about 240 feet. In a hole sunk not long ago near Hibbing a thickness of ore of 433 feet was found in one hole almost surrounded by shallow ore over taconite, no attempt to penetrate the taconite being made. Another deep ore body is being shown in the same district, where a thickness of more than 300 feet has been shown. The amount of work now under way is not discovering anything like the quantity of ore that would have been shown, in all probability, by a similar exploration a few years ago, but it is apparently being well rewarded nevertheless.

The most elaborate explorations now going on in the old ranges are in the Republic trough, Marquette range, for parties generally presumed to be the Clergue syndicate. A considerable force of men is employed, but nothing is known of results. Explorations on the Menominee range consist principally in work upon properties that have shown satisfactory indications, and most of the work is by shafts and openings. Few drills are employed.

Aside from the Mesaba districts there is more drill exploration in Canada than anywhere else in the Lake Superior country. This is not confined to the Michipicoton region, but to the west of Lake Superior, near Steep Rock Lake, on the upper Seine River, considerable is under way and great things are planned. Interests represented there are the Clergues, R. Pumpelly and associates, Mackenzie, Mann & Co., Port Arthur, Duluth and Chicago men, and persons supposed to be backed by the United States Steel Corporation. Aside from the drill work a number of shallow shafts will be sunk and much cross cutting carried on during the winter. Considerable machinery suitable to this has already been taken into the region. At another Canadian point, west of Lake Superior, and on Turtle Lake, discoveries have been made of what is claimed to be very high grade magnetites. This location has been carefully prospected and will be examined thoroughly another season. Assays of selected samples run as high as 69 per cent. in iron and some are said to show a high percentage of nickel.

The Duluth & Iron Range Railroad, a property belonging to the United States Steel Corporation, is handling this winter the largest pine log traffic of any railroad in the Northwest. It has contracts to move about 140,000,000 feet of pine logs before the opening of navigation, and is bringing into Duluth from 220 to 250 carloads of logs daily, or almost 1,250,000 feet per day. The company have been obliged to secure cars from other lines in order to handle this business. They expect this traffic to continue in great volume for perhaps a decade, after which the logging business along their line will be a thing of the past. This road is now raising its approach and yard for No. 3 dock 10 feet, the work requiring about 100,000 cubic yards of earth.

Captain W. H. Johnson, Marquette range representative of the Oliver Iron Mining Company, now has charge at the Negaunee mine, which had been under care of Joseph Sellwood of Duluth as mining superintendent for the American Mining Company. The properties of the American Mining Company on all ranges have passed under the management of the general superintendents for each range of the United States Steel Corporation ,in accordance with the plan outlined in this correspondence some weeks ago. Drilling has commenced on the Breitung lands at Negaunee at a point where ore was found some years ago.

The Famous Section 30.

By a decision of the United States Supreme Court last week the final ownership was settled to a part of the famous "section 30," being section 30, T. 63, R. 11, on the Vermillion range. The section has been in the courts for nearly 20 years, and the parties to whom the ownership has at last been awarded were the original locators, who placed Sioux half breed scrip on the land in 1881. The magnificent iron outcroppings here were found by a prospector named Byrnes, who was working for Charlemagne Tower, the head of the Minnesota Iron Company. Byrnes coming to Duluth to make his report, sold or lost his secret to Eaton & Merritt, local men, who at once filed Sioux scrip covering the location. In a few years they were ruled out of the controversy by a decision of the Interior Department, and the land has since then been fought over by the Minnesota Iron Company, the Germania Iron Company, and numerous individuals. By reason of a stipulation entered into by the attorney for Eaton & Merritt and the Germania Iron Company, the rulings of the court apply to nearly all the land in dispute. Portions of the section not included in this decision have already been fought to a finish in the courts and are the property of the Minnesota Iron Company and the Oliver Iron Mining Company, under leases. While wild statements of the supposed value of the land under this decision are appearing in print, nothing can be said definitely, as while perhaps $500,000 has been spent to gain possession of the tract no exploration has even been carried on there. It is quite possible that the United States Steel Corporation, through one of their subcompanies, may secure this tract from the present owners under lease, in which case the exploration of the land will be carried out, and if ore is found it will be opened as a mine. The location is east of the Ely district, probably a continuation of it, and the surface showings are such as would indicate a magnificent body of high grade hard ore. The general feeling among those that have an interest in the case is one of congratulation that this long and famous case is over, that local and hitherto poor men are in possession and that the probable wealth of the section is to be opened into shortly. D. E. W.

A wage conference was held in Pencoyd last week between officials of the American Bridge Company and representatives of the Structural Iron Workers' Union. The conference was to arrange a general agreement between the American Bridge Company and the structural men for the year beginning May 1, and that will go in force in all of the plants of the concern. It is understood that the men will ask for some changes in the present wage agreements and that the rate or pay will differ according to the different locations of the mills. The conference was called at the request of the general officers of the American Bridge Company, who were to have the matter settled.

For the past six years the tonnage of rails purchased by the Baltimore & Ohio Railroad Company is as follows: 1896, 22,098 tons; 1897, 31,547 tons; 1898, 35,197 tons; 1899, 75,618 tons; 1900, 71,955 tons, and 1901, 40,651 tons.

Notable Work in Reconstructing Compound Engines.

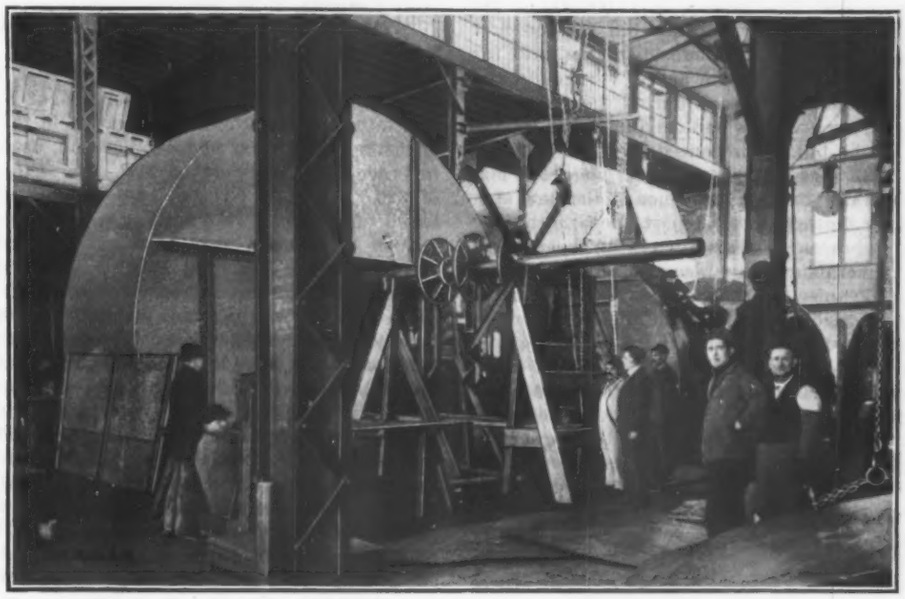
The Charles F. Elmes Engineering Works, Chicago, have recently executed an interesting achievement in the reconstruction of the engines in the electric lighting plant operated by the city of Chicago at Blue Island avenue and Halsted street. We are indebted to the *Western Electrician* for a description of the work to be done and how it was accomplished. This plant has two vertical compound engines, which were installed some eight years since, and at that time formed the largest municipal lighting station in Chicago. The engines as originally built were experimental in the construction of their valves and the moving parts, which operated and regulated the valves. The valves were double ported and similar to Corliss engine valves. The exhaust valves were worked by an eccentric to a rocker shaft and then connected to a peculiar wrist plate. A Porter-Allen link, connected to a rocker shaft and then to a similar wrist plate, worked the main valves. The governor was of the Porter style and actuated a valve which operated a duplex pump. This pump worked a hydraulic piston, which in its turn operated the block on the Porter-Allen link.

Although the governor anticipated the requirements of the engine, yet, as a result of this complicated mechanism and the multiplicity of moving parts, the time consumed by the slow running pump and hydraulic piston was so great that it was necessary to have a man almost continually at the throttle, or else carry the steam to suit the load. The latter was quite uniform, as the plant supplied arc lights almost exclusively, and the engines were permitted to run in this condition until quite recently. During this time many shutdowns were caused by broken links, wrist plate pins, eccentric rods and other portions of the mechanism. The engines also pounded considerably, which resulted in the loosening of one crank pin and the breaking of another.

It was decided to redesign and reconstruct these engines and increase their power and efficiency. The engines were constructed of the best material and with excellent workmanship, the fault being essentially in their design and not in their construction. One engine was reconstructed last autumn, and the result of the change was so successful that the second has been altered in the same manner, having been put in operation early in the present month. The city electrician, E. B. Ellicott, directed the changing of the engines and Charles F. Elmes personally supervised the execution of the work.

All the parts above the upper ends of the columns of the engines were removed, including the high and low pressure cylinders, all the valve gear, the governor, the pump and the hydraulic cylinder. The old cylinders were 20 and 24 inches in diameter, with a 28-inch stroke, and the engines had a speed of 150 revolutions a minute. The steam pressure had to be carried at 180 pounds, to keep up the necessary current on the lighting system. Two new cylinders were supplied, one 22 and the other 49 inches in diameter, with the same stroke as before, each cylinder being equipped with piston valves. The high pressure main valve is now actuated directly by the shaft governor and the low pressure main valve directly from an eccentric. An independent cut off is also actuated by direct connection to its eccentric, the point of cut off being determined by hand adjustment through a right and left hand screw on a stem, this device being known as the Myers cut off. The amount of receiver pressure, varying from 15 to 30 pounds, is changed to suit the number of lamps and is ascertained by taking indicator cards. A double arm inertia governor was substituted in place of the old governor.

The improvements have greatly reduced the number of rods and moving parts. The old engines each had 24 working parts to actuate the valves, with 16 stuffing boxes under full pressure, while now each has only four rods to work the valves and three stuffing boxes under receiver pressure only. Each of these engines formerly developed from 650 to 750 horse-power on 180 pounds of steam, while now 1000 horse-power is easily obtained on 150 pounds, and either engine can be safely loaded up to 1200 or 1400 horse-power, while the revolutions have also been reduced from 150 to 130. The work of reconstruction was so satisfactorily accomplished that the duty and power of the engines have exceeded the guarantee given by the Elmes Engineering Works.



LARGE FAN FOR MECHANICAL DRAFT.

Large Fan for Mechanical Draft.

The American Blower Company of Detroit, Mich., recently produced a fan of unusual dimensions to be used in a mechanical draft installation. It is intended for producing forced draft in a boiler plant of 10,000 horse-power, and does away with the use of a chimney. The fan will be used in connection with Roney stokers, the fuel employed being anthracite buckwheat No. 2. It has a wheel 18 feet in diameter, inclosed in a housing constructed of steel plate and beams, standing 30 feet high. The accompanying half-tone shows this fan in course of construction in the new shop recently completed by the company for the special manufacture of this apparatus.

The Ship Subsidy Bill.

WASHINGTON, D. C., January 21, 1902.—The Senate Committee on Commerce, on the 17th inst., by a strict party vote, authorized a favorable report upon the new Ship Subsidy bill, and Chairman Frye yesterday presented it in the Senate. The measure will come up for discussion at an early date, and with an excellent prospect of enactment. The discussion in committee developed the fact that the bill will receive the support of several very influential Senators, to whose lukewarmness concerning the bill pending in the Fifty-sixth Congress the death of that measure was largely due.

The support gained by the new bill over the old is based upon its very conservative provisions, both with regard to total expenditure and to the method of distribution by which a comparatively small aggregate is distributed among a large number of vessels. Senator Frye estimates that the bill will not result in an expenditure exceeding $2,800,000 in excess of the present outlay for mail subsidies after deducting foreign postage. He calculates that a comparison of this year's foreign mail business with the expenses under the proposed system when in full operation will produce a deficit of $1,800,000, which, however, will be reduced as the postage receipts increase. The balance of $1,000,000 of the estimated expenditure under the new bill for the first year is assigned to the general subsidy to be paid for cargo vessels on the basis of the actual voyages in the foreign trade by American vessels during the year 1900, assuming that all such vessels had complied with all the requirements of the bill. It is conceded, of course, that the subsidy will increase as the American merchant marine grows under the fostering influence of the new law.

An interesting feature of the report upon the bill by Senator Frye embraces a discussion of the measure as it affects the American shipbuilder and shipowner.

"The ocean steamer in foreign trade," says Senator Frye, "stands in a different relation to the American purchaser from any other manufactured product. It is wholly separated from the operation of the tariff laws. If the American purchaser does not like the price of an American built steamer for the foreign trade he is entirely at liberty to purchase a foreign built steamer for the same trade, and employ her for that purpose with the same freedom as if built in the United States. This bill does not change that condition in any respect.

"If prices of home built ships should be improperly increased under its provisions American shipowners would purchase vessels abroad, as at present, there would be no expenditure for subsidy, and Title II would become a dead letter. The market for American ships and the incentive to American shipbuilding which the bill undertakes to supply depend, therefore, on the cordial co-operation of American shipbuilders with its purposes. In precisely the same manner the American shipbuilder for some years has been at liberty to import free of duty all of the materials for a ship to be used in the foreign trade. Manufacturers of steel plates and forms, undertaking to raise prices to American shipbuilders, will either turn the latter to the importation of materials free of duty from abroad, or will check American shipbuilding. So far as the foreign trade is concerned (with which alone this bill deals) the American shipowning and shipbuilding industries are conducted on the basis of absolutely free trade.

"The bill does not change this general situation. It provides that if an American shipowner will build his vessel in the United States, employing home labor, if he will sail his vessel under the American flag with American officers and crew, if he will perform certain stated services for the American Government and hold himself in readiness when required to perform others, so long as he shall use the vessel under these conditions in promoting the foreign commerce of the United States, then he shall be paid a subsidy sufficient to place him on an equality with a foreign shipowner, who is giving to foreign labor, to a foreign government and to the trade of a foreign country the benefits which this bill endeavors to secure for Americans and the American Government.

Rate of Subsidy.

"The general rate of subsidy proposed is 1 cent per gross ton per 100 nautical miles sailed. This rate is designed to equalize the difference in the cost of building in the United States and operating under American laws an ocean steamer in foreign trade and of building in Great Britain and operating under British laws a similar steamer.

Cost of Construction.

"The United States has built so few ocean steel cargo steamers available for the foreign trade that precise comparisons of the cost of building such vessels here and in Great Britain are not readily made. The Boston Steamship Company (Alfred Winsor of Boston, president) in 1900 built two such cargo vessels, for the construction of which bids were tendered by American and British builders. The Atlantic Transport Company (B. N. Baker of Baltimore, president) are now building six steamers in the United States from plans similar to those of their steamers recently built or building at Belfast, Ireland. The eight steamers range in speed from 10 to 11 knots to 16 knots, and in size from 3750 tons to about 13,000 gross tons, aggregating 70,000 gross tons. The price of the eight American built steamers will be $7,169,600, the price of the eight corresponding British built steamers $5,307,440.

"The average price per gross ton of the American built steamers is thus $102.40, and of the British built steamers $75.80, a difference in first cost of $26.60 per gross registered ton. This difference of $26.60 is carried into the annual cost of operation in the three forms of insurance, interest and depreciation, usually reckoned together at 15 per cent. on first cost. Fifteen per cent. of $26.60 is $3.99. At the present time the difference based on first cost in operating an American built and British built ocean steel steamer, designed principally for cargo, is, as nearly as may be, $4 per gross ton per annum. The difference based on wages of the crews is $1.50 per gross registered ton per annum. The combined difference is $5.50. At the rate of 1 cent per gross registered ton per 100 nautical miles sailed a steamer would be required to sail 55,000 miles a year to obtain a subsidy of $5.50 per ton. In his recent report the president of the Peninsular & Oriental Steamship Company congratulated the shareholders that the 65 steamers of the company during the past year had each averaged 56,000 miles during the year. The average speed of that great English fleet is 14½ knots. In 1899 the steamers of that fleet averaged 52,500 miles. The 62 steamers of the greatest French line, the Messageries Maritimes, averaged 50,000 miles last year. The ocean steamers of the North German Lloyd averaged about 56,000 miles. Excluding fast mail steamships, which are provided for under the head of Mail Subsidies, an average mileage of 50,000 miles a year for American steamers in foreign trade would be a very creditable performance."

The new bill is designed to encourage long voyages by limiting the subsidy to 16 entries in any one year, and in this respect the measure differs from subsidy bills recently before Congress. "This difference," says Senator Frye, "is based on changed conditions. Since former bills were drafted the coasting laws have been extended to Hawaii, 2000 miles from our Pacific coast, and to Porto Rico, in the West Indies, 1400 miles from New York. An additional stimulus has thus been already afforded to the construction of certain types of vessels, and with trade with the West Indies, Mexico and Central America American tonnage has gained faster than foreign tonnage, though foreign tonnage in those trades still outnumbers American almost two to one.

"The present trade requirements of the minor ports of the West Indies, Central America and the Caribbean coast of South America are satisfied with steamers of about 2000 gross tons. Within the past two years the shipyards of the great lakes have been constructing vessels of this size for the seaboard trade. During the past fiscal year nine such steamers were built and sent through the Canadian canals to salt water. The large scale on which the building of steel steamers is conducted on the lakes, joined with natural advantages,

has already permitted economies in construction which our seaboard yards, owing their existence to naval construction, have not yet attained in merchant construction. Lake shipyards are building steamers of 2000 tons or thereabouts for the seaboard at a less difference in cost than that used as the basis for general subsidy rates.

"Such steamers, it has been demonstrated, are available only for short routes or coasting voyages. If 50,000 miles be accepted as the average mileage of an ocean steamer, and 16 voyages be the limit of subsidy payments, evidently each round voyage must be over 3000 miles to get the full subsidy. If the round voyage of a vessel is about 2000 miles, it will make about 24 round voyages in covering its annual mileage of 50,000 miles. It will be paid a subsidy on only 16 out of 24 voyages, so that in effect it will be paid for the year at only two-thirds of the rate payable to the vessel engaged on long voyages across the Pacific or across the Atlantic.

"The lower rate involves no discrimination, because the smaller vessel on the shorter voyages has advantages in competition with the foreign vessel which the larger vessel on the longer voyage does not have. Besides those mentioned, and of even greater value, is the privilege of changing from the coasting trade to the foreign trade and *vice versa*, according to conditions of the freight markets—a privilege, for structural reasons, not usually open to vessels of great tonnage.

"The purpose and certain result of the bill in all its features is and will be to lead to the construction especially of vessels of large carrying capacity. Permanently low rates of ocean freights, as far as shipbuilding is involved, can be obtained more surely and expeditiously in this manner than in any other, because they will be based on permanently low cost of operation to the shipowner.

The Pacific Trade.

A feature of the new bill differing from the measure pending in the last Congress is its bearing upon the Pacific trade. The rates of subsidy proposed are uniform for the Atlantic and Pacific oceans. "Special conditions, however," says Senator Frye, "render it certain that the earliest and most rapid development of American shipping under the bill will be on the Pacific. While American shipping in trans-Pacific trade (excluding Hawaii) has been stationary, and foreign shipping has doubled within four years, nevertheless that trade is not so completely in possession of ships under foreign flags as is the trade of the Atlantic. The opportunity for new American maritime ventures is greater.

"To Yokohama the distance from the seaports of England and Germany is, in round numbers, 12,000 miles, while by the shortest route from our Pacific coast it is only 4200, and by way of Hawaii only 5500 miles. To Hong Kong the distance from the same European ports is 10,000 miles, in round numbers, while our Pacific coast routes vary from 6300 to 7500 miles. The distance from Sydney to Plymouth is 12,250 miles, to San Francisco 7250 miles. The advantage is partly offset by the coaling and trade advantages of the Suez route. Thus from English or German ports steamers on these long routes stop at Marseilles or Naples, Port Said, Aden, Colombo, Penang and Singapore, trading and coaling at several of these ports, while steamers directly crossing the Pacific must carry coal for the voyage. The coal occupies space at a loss, which steamers by the Suez route fill with cargo at a profit.

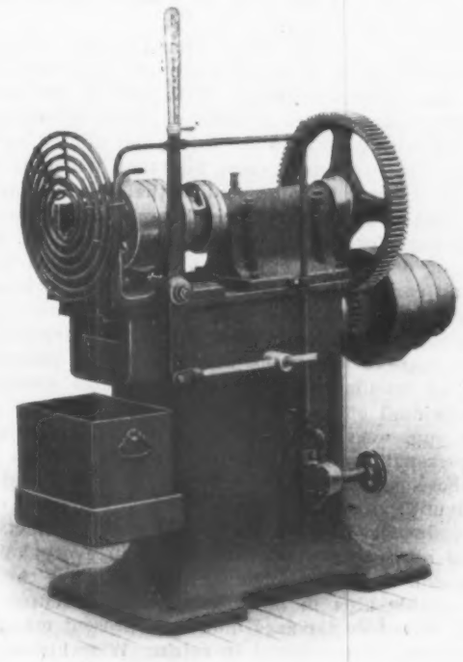
"American trans-Pacific steamers must, therefore, be larger than European steamers by the Suez route, and, as shown, the bill favors large steamers on long voyages. American wages on the Pacific Coast are the highest in the world, while a very large percentage of the crews of foreign steamers through the Suez Canal are Lascars and Asiatics at low rates of wages. In such competition the difference in pay rolls will be much greater than that already estimated. On the other hand, vessels through the Suez Canal are required to pay tolls which average $1.25 per gross ton on each passage, an amount equal to the general subsidy proposed by the bill for a new steamer on a voyage of 10,000 miles. The combined effect of all these factors is to place the American vessel on a trans-Pacific voyage in competition with a foreign vessel from British, French or German ports to China, Japan or Australia, in a much more favorable position than the American vessel in competition with foreign vessels from European ports in the trade with Europe or South America.

"In the direct trade between the American ports on the Pacific and the ports of China and Japan, the position of the American steamer running side by side with British or German steamer will be about equivalent to the position of the American steamer in the trade of the Atlantic. The former shipping a large part of its crew on the Pacific Coast, the latter shipping its crew in Hong Kong, the position would not be so favorable, for the extreme difference in wages is here involved. Such British or German steamers, to be always away from their home ports, will, as a rule, be under long charter to or actually owned by Americans, and will contribute at least to the development of the export trade of the United States."

In the discussion of the bill soon to begin in the Senate the entire minority, with one or two exceptions, will oppose the measure, on the ground of policy, the attitude of the Democracy in both House and Senate being against subventions of all kinds. It is understood that Senator McLaurin of South Carolina may favor the bill as his constituents have petitioned him in its interest. The minority will be almost a unit, however, against the measure, and in favor of the substitute "Free Ship" bill, prepared by Senator Vest of Missouri, which grants American registers to foreign built vessels of any tonnage. W. L. C.

The Morgan Coil Theading Machine.

The Reliance Machine & Tool Company of Cleveland, Ohio, have so modified their bolt cutter as to adapt it



THE MORGAN COIL THREADING MACHINE.

specially for the threading of pipe coils. The general design of the machine will be understood from the engraving. The threading head is the same as used on their bolt cutter. The carriage travels on the ways under the head and has 6 inches of travel. The grips are 1 inch deep. The machine will handle coils up to 40 inches in diameter.

Reports that the Pittsburgh Coal Company were about to extend their coal property in the Hocking Valley field have been officially denied.

A Celebration at Pencoyd.

In the presence of a large number of guests prominent in the iron and other industries, and several thousand workmen of the Pencoyd Iron Works, Percival Roberts, Jr., former president of the A. & P. Roberts Company, now chairman of the Executive Committee of the American Bridge Company, was tendered a reception on Saturday evening, the 18th inst., at the Pencoyd Club, Wissahickon, Philadelphia, by the employees of the Pencoyd Iron Works, and for the presentation of a testimonial book to Mr. Roberts by the employees. The reception was in commemoration of Mr. Roberts' 25 years' active interest in and successful management of the affairs of the A. & P. Roberts Company. The club house was thrown open to the guests and the reception proper was held in the auditorium, which was tastefully decorated for the occasion. The ceremonies were presided over by James Christie, chief mechanical engineer of the Pencoyd plant, who reviewed

The History of Pencoyd.

In 1876 Pencoyd was a small, humble iron mill, that occupied a minor place among the kindred industries of the State; Wissahickon was a pretty railway station, that led the way to Roxborough; but few residences were here; the private grounds that surround the house that this club now occupies included most of the land between Ridge avenue and Sumac street, and stretched back to farmed lands in the environs. It is true that Pencoyd had begun to expand before, and during the Centennial year the large stone building that we now call the old mill had taken visible form, but expansion was not in fashion for the years of prostration following the Centennial. Toward the close of the Centennial year a new character appeared on the Pencoyd stage. The gentleman we have assembled to greet this evening came to the front, a youth fresh from school, and he soon forged to the front as a leader in the further development of Pencoyd.

There is an old proverb, "That the boy is father to the man"—and never was the proverb more amply verified than in this instance. With earnest intensity of thought and purpose, breadth of view, planning and building with a view to the future not limited by what is best for to-morrow only, but that which is to be wanted in years to come, and, withal, a wise conservatism that avoided the plausible and illusive schemes of the day—for industry has its fads as society has—a spirit of democratic fellowship that prompted him to lend an ear to the humblest worker, and, without any waste of sentiment, to strive in a practical way for the adoption of any improvement, any innovation that would tend to lessen the toil of labor or quicken the spirit of intelligence to yield more ample recompense to individual effort—in these and innumerable similar ways you, who know him best, can easily recognize the personal characteristics of Percival Roberts. During these past 25 years Pencoyd has grown and prospered until it stands among the best equipped of the steel industries of the State; its fame and products have spread abroad and are well known in every land; its reputation is international, and nothing but the want of available area in its surroundings prevented these works from now far exceeding their present magnitude. It has been instrumental in raising Wissahickon from the humble way station of 25 years ago to become one of the handsomest and most prosperous suburbs of Philadelphia.

In the fullness of time, as the logic of events demonstrated that co-operation and combination of effort best promoted the cause of industry, Pencoyd became partner in a large industrial corporation, in which she took a leading place, and Percival Roberts was called from his former field of activity to take a place in the councils of the new corporation.

At the close of the past year a wide sentiment was expressed that we should commemorate the twenty-fifth anniversary of his connection with Pencoyd by some tangible memento which would serve to remind him of the regard and esteem of his associates. You appointed a committee to execute your wishes, and as a result a volume was prepared which, by the aid of pen and camera, illustrates in a manner the work of the past quarter century at Pencoyd. Your committee in making this presentation, as they did within the limited confines of a dwelling house, realized that only a large hall would accommodate the many who desired to meet and congratulate Mr. Roberts, and for that purpose we have assembled here.

Therefore, Mr. Roberts, in behalf of our fellow workmen and their friends here assembled, we take great pleasure in greeting you at this epoch of a useful career, and to you, fellow workmen and friends, I make the almost unnecessary formality of presenting Percival Roberts.

This was followed by an address by Percival Roberts, who said in part:

While fully conscious and proud of this personal appreciation, I cannot but regard it as a token, a recognition, of a principle which extends far beyond the life of any one man, as enduring as the ages which have passed and those which are yet to come, a principle to which I have endeavored to adhere and which this gathering here to-night tells me far more successfully than I dared believe; a principle which has made Pencoyd what it is to-day, and which, if followed, will continue her successful career—the principle of fair play, trust and confidence, each for the other, equal opportunity for all.

This year, which marks a little more than the twenty-fifth of my connection with the Pencoyd Iron Works, contains another anniversary—the fiftieth since the establishment of these works. Founded in the year 1852 by Algernon and Percival Roberts, the original agreement, which has been in my possession, read that the former contributed $2000 and the latter $3000, and with this combined capital of $5000 they proposed to build and operate a forge to be known as the Pencoyd Iron Works. From a daily journal in the handwriting of Algernon Roberts I copy this first record:

"1852, June, Monday, 21st.

"Commenced with four carpenters, a boy and three laborers, the first at framing and the others cutting the level of the building. Received part of the hammer from James Rowland & Co."

In such manner the daily entries are made. Sometimes the little force increases, sometimes diminishes; one day they raise a roof truss, again they unload sand from a canal boat; a team hauls coal from Philadelphia, as the railroad is unwilling to give them a siding. At last all is in readiness, the hammer installed and the first order secured.

"1852, October 28.

"Saw A. Whitney & Sons and obtained the following order for axles on trial:

4¼-inch hub, 3⅜-inch center } 10 or 20 axles."

Such entries show the modest beginning of the plant with which you are now connected. Gradually enlargements were made, the details of which are fully set forth in the memorial volume, and I will not detain you with a repetition.

The commencement of the project of a centennial exhibition in 1876, in the city of Philadelphia, marked an important change in the output at Pencoyd. The 23-inch mill, originally designed for rolling axles and shafting, was used for structural shapes, and A. & P. Roberts & Co. secured, much to the surprise of all other competitors, the contract for the fabricated structural material for these buildings. The material was rolled at Pencoyd and the fabrication principally done at Edge Moor, these shops having been recently built.

Pencoyd now became a manufacturer of structural shapes. How great a change has taken place since then you will appreciate when I state that the hot bed of the 23-inch mill was but 16 feet long and 10-inch channels used in columns some 35 feet long had to be rolled in two lengths.

It was about the close of the year 1876, I think in the month of November, I came to Pencoyd. Of this Pencoyd nothing is left to-day but the stone building containing the 12 and 23 inch mills and these two trains; all the rest has given way to more modern im-

provements. Times were dull. The 18-inch mill was running, the 12 and 23 inch were idle; when sufficient orders accumulated we would stop the 18-inch mill and put the crew for a few days on either of the other two mills—you can imagine the success we had with quick rounds under such an arrangement.

Our office was located at the edge of the road which extended along the entire river front, about where the stock piles of the 23-inch mill now are. It consisted of two small rooms, one of which was occupied by the members of the firm and the mechanical engineering force, composed of Jas. Christie, who was located in one corner with a drawing board. The other room contained the entire clerical staff, consisting of a paymaster, a timekeeper and a shipping clerk, to which force I was added in charge of articles received and the records of the mills.

Later on various outside duties were given me, such as shearing iron, &c., and I finally took charge of the puddling mill, taking up my residence in house No. 2, Rolling Mill lane. We all kept working and the works kept growing.

We stand to-day upon the threshold of vast and far reaching industrial developments. The twentieth century dawns upon social conditions new to history, and in their solution it is our own country which will play the most important part.

Much is now read and heard spoken of what are misnamed "trusts;" also of combinations of wage earners termed "unions," both of which have, in my judgment, become permanent factors and destined to play a very important part in the world's development for some time to come. I do not intend to enter into a discussion of their merits or their faults; it is sufficient to say I do not think either the trust or the union is to be feared, provided they be based upon American principles and governed in the spirit of American institutions. If the by-laws of every such organization should be based upon the principles of the Declaration of Independence of the United States, and its operations be conducted in accordance therewith, we should have taken a long step in the right direction.

As this country separated itself politically from the older forms of European governments, so must we today strive to eliminate from our midst those social elements which destroy the equality of opportunity for each individual one of our people, and to be freed from which so many among us have left behind them home and friends to find in a new land the fulfillment of their hopes. Should the idea I have just expressed be carried out many radical changes will occur, especially in the systems which now control what we term "unions," and yet I believe that the successful solution of the problem will be a separation from foreign systems as absolute and distinct as we have achieved politically, and which in the past was looked upon with scorn by all the older nations of the world.

At the conclusion of his address Mr. Roberts shook hands in farewell with the employees, who passed in file before him, each of whom received a handsome souvenir of the reception, in the form of a pamphlet containing a brief history of the Pencoyd Iron Works' remarkable growth.

The Testimonial.

The testimonial presented to Mr. Roberts, the retiring president of the Pencoyd Iron Works, by the employees was in massive book form, 20 x 12 inches, consisting of 72 pages of extra heavy bristol board.

The title page, which carried out the general style of the old missal and illuminated manuscript of the fourteenth and fifteenth centuries—the capital letters being highly ornamented in pure gold, brilliantly tinted and burnished—bore the following inscription:

1876. 1901.

TO

PERCIVAL ROBERTS, JR.

In commemoration of
Twenty-five years' devotion to
the interests of the Pencoyd Iron works
This token of Remembrance
is affectionately addressed.

Then followed the addresses from the employees, occupying four pages, illuminated as on the title page. After this, on alternate pages, were mounted a series of 66 most artistic photographs, showing a portrait of the retiring president, his office, and a complete series of interior and exterior views of the works. The photographs were from the studio of Alfred Holden of Wissahickon, and the interiors especially reflected the greatest credit to his art, as they were all taken at the greatest disadvantage on account of the extreme heat and smoke which he had to cope with.

On alternate pages, facing the photographs, were engrossed a general history of the works, from their installation up to the present date. Detailed descriptions of the capacities of the forges, rolling mills, steel mills, bridge and construction shops, bridge and construction forge shops, eye bar shops, electric power and lighting plant, boilers, engines, pumps and gas producers, followed by a detailed statement showing weight in pounds of export shipments for the years 1894-1901, inclusive.

After this came a chronological history of the works and their growth, from their founding in 1852 for the manufacture of heavy hardware down to the various and important additions made in 1901. This was followed by tabulated statements of finished products of the works in tonnage, from 304.4 gross tons in 1853 down to the colossal shipments in 1900—226,287 gross tons. The following 12 pages bear the names of over 1300 subscribers to this testimonial, these names being engrossed by hand in *fac-simile* of the individual signatures. The last two pages of the book were occupied by photographs of St. Timothy's Hospital (the Percival Roberts Memorial Building) and the Pencoyd Club.

The book was bound in blue turkey morocco and lined with rich corn colored moiré silk, and applied to its outside cover was a massive monogram of the recipient's initials, between the dates 1876-1901, hand chased in sterling silver and finished in rose colored gold plate. The book rested in a large case bound in leather to match its cover, and lined with corn colored moiré silk and satin, with heavily gold plated furnishings. The entire work, with the exception of the photographs, was the work of the stationery department of the Bailey, Banks & Biddle Company.

Among the invited guests were James Gayley, E. H. Gary, Charles Steele, E. C. Converse, D. G. Reid, William Edenborn, E. W. Shearson, Richard Trimble, officials of the United States Steel Corporation; G. H. Glover of the Standard Oil Company; Francis Kimball, Max Lewinson, George Just, Theodore Starrett, Henry S. Thompson, Charles M. Jacobs, J. Vipond Davies, Charles Macdonald, W. H. McCord, W. H. Connell, H. Schoonmaker, John F. O'Rorke, Arthur McMullen, K. Iwasbita, Alfred P. Boller, Henry W. Hodge and A. S. Mitchell of New York; Walter G. Berg, chief engineer of the Lehigh Valley Railroad, New York; Charles W. Buchholz, chief engineer of the Erie Railroad, New York; W. J. Wilgus, chief engineer of the New York Central & Hudson River Railroad, New York, and W. Barclay Parsons, chief engineer of the Rapid Transit Subway, New York, and A. A. Miller, *The Iron Age.*

The Brown Platinum Pyrometer Patent.—Judge Coxe of the United States Circuit Court, Southern District of New York, has rendered a decision in the case of Edward Brown, the well known manufacturer of pyrometers, against August Zaubitz. The case involved the infringement of the patent, No. 494,245, granted to Brown on March 26, 1893, for the platinum pyrometer, the novel feature of which consists of the introduction of a platinum expansion strip, V-shaped in cross section. Judge Coxe states in his decision: "The Court prefers to rest the decision mainly upon the defendant's own declarations that his platinum pyrometer was constructed two years after the date of the complainant's patent." The Brown pyrometer is in use at a very large number of leading iron and other industrial plants, indicating, as it does, in a few seconds the temperature of heated air or gas up to 3000 degrees.

The Fluctuations in the Prices of Iron and Steel.

[With Supplement.]

The accompanying plate, showing graphically the fluctuations in the prices of crude and finished iron and steel for the period of 1893 to 1901, both years inclusive, hardly needs an explanation. We print the prices upon which the diagram is based, so that they may be readily referred to. These figures are the monthly averages of the weekly quotations published in *The Iron Age*, but in order to place all the figures on a common basis we have converted all the quotations which are expressed in cents per pound into dollars per gross ton. It is thus possible to express graphically very closely the relation which has existed from time to time between the raw material and the finished product. It is thus an easy matter to follow the course of gray forge pig iron and iron bars, to note to what extent the movement of Bessemer pig influenced the fluctuations in steel billets, and what relation the changes in price of the latter bore to such finished products as rails, plates, beams and wire products. In such lines as nails, unfortunately, the continuity of the curves is interrupted by changes in the base price. The time of such change is clearly indicated in the diagram, for instance, in 1893 for cut nails and in 1895 for wire nails. When pools or price agreements controlled a special branch of an industry the breaks are indicated. An example of this is furnished by the prices for steel rails in the fall of 1893, and in the spring of 1897.

The diagram shows very nicely the "soda water rise" of 1895, the low range of values in 1897 and 1898, the boom of 1899, the break in the spring of 1900, and the steadiness of values since the fall of that year, at a fair level.

The New Springfield Machinery Plant at Bridgeport.

The Springfield Mfg. Company, Bridgeport, Conn., manufacturers of emery grinding machinery, advise us that their new plant, designed by George H. Jackman, general manager of the company, and recently erected on Mountain Grove street, is a model of convenience and economy. The front part is of brick, 160 x 60 feet. On one side of this part are the entrance, general offices, private office, drafting room and pattern shop; on the other side are the store room and emery wheel plant. A wooden extension back of the front part, 100 feet long and 120 feet wide, one story, with a monitor roof, is used as a machine shop. Running through the center of the machine shop and to the front of the building is a crane way with two travelers, by which materials and machinery can be carried from the furthest part of the machine shop to the front of the building, where are located the scales and driveway. The several apartments in the front part of the building are asbestos lined and sheathed with steel, and are said to be fire proof. Excepting in the offices and drafting room, all floors are concrete. Electric power is used entirely, and the company make their own gas and pump all the water used. There is plenty of ground adjoining owned by the company to allow the building of additions as the growth of their business requires.

The convention of the United Mine Workers of the Pittsburgh district adjourned last week. A demand for increased wages will be presented to the operators when the joint conference is held. The chief increase asked for is in the scale for the run of mine coal. The price at present paid by the operators is 51.71 cents in the thick vein. The convention demands an advance of 10 cents a ton in each.

The Alan Wood Company have started work on their new plant for the production of basic open hearth steel. Five 50-ton furnaces will be erected, having a capacity of 100,000 tons of steel a year. The new plant is situated at Ivy Rock, about 1 mile north of Conshohocken, and will extend over 175 acres of ground. The purpose of the plant is to supply the Alan Wood Company's sheet mills at Conshohocken with slags and billets. At the present time the company have to buy their billets, and a considerable saving will be effected when the new plant is in operation.

The Witzenmann Metal Hose.

The American Metal Hose Company, 40 Dearborn street, Chicago, are general sales agents for the United States of the Witzenmann metal hose or flexible metallic tubing. This hose is extensively used in Europe, and although but recently introduced in this country has met with favor. It is made entirely of metal, is more flexible than rubber hose of equal dimensions and is of about the same weight. When the product was first placed on the market many engineers thought it was impossible to make a steam tight hose entirely of metal which would have such flexibility. This quality has been secured by its peculiar construction. It is composed of a metallic tape which is rolled up in the form of a spiral, so that the edges overlap and fit into each other tightly without detracting from its power of motion. As the tape is rolled up it forms a groove for the reception of a packing, which is completely inclosed in the metal as it rolls, where it remains fully protected from internal or external wear and tear. The packing causes the tubing to be perfectly tight, while the jointing induces a flexibility superior to rubber hose of equal dimensions.

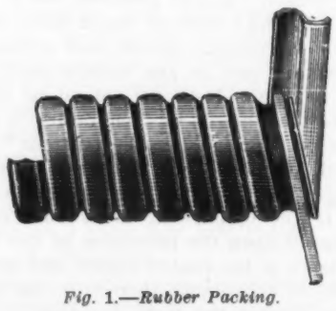


Fig. 1.—Rubber Packing.

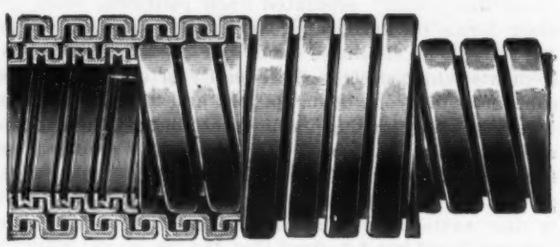
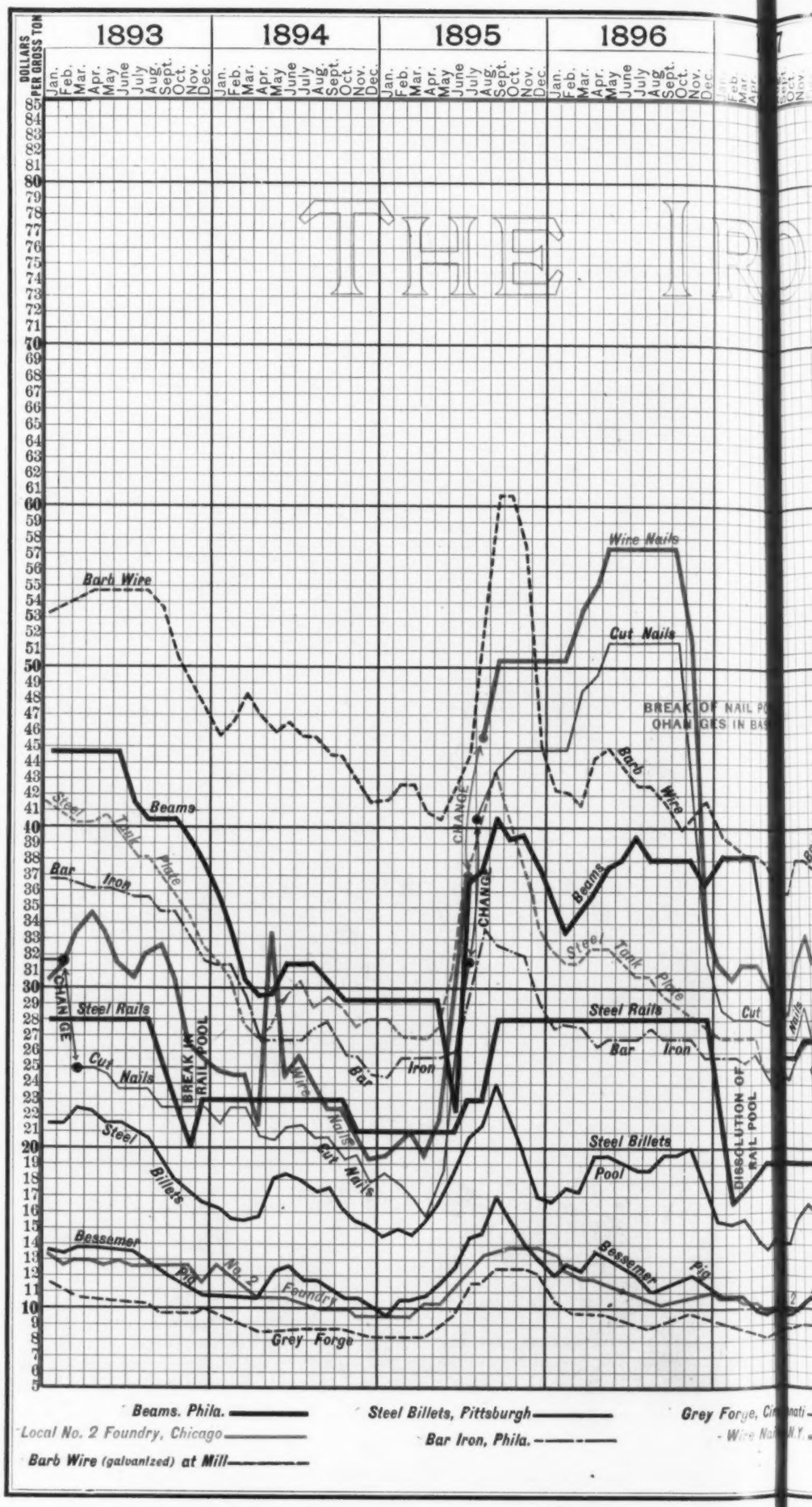


Fig. 2.—Double Hose for Steam.

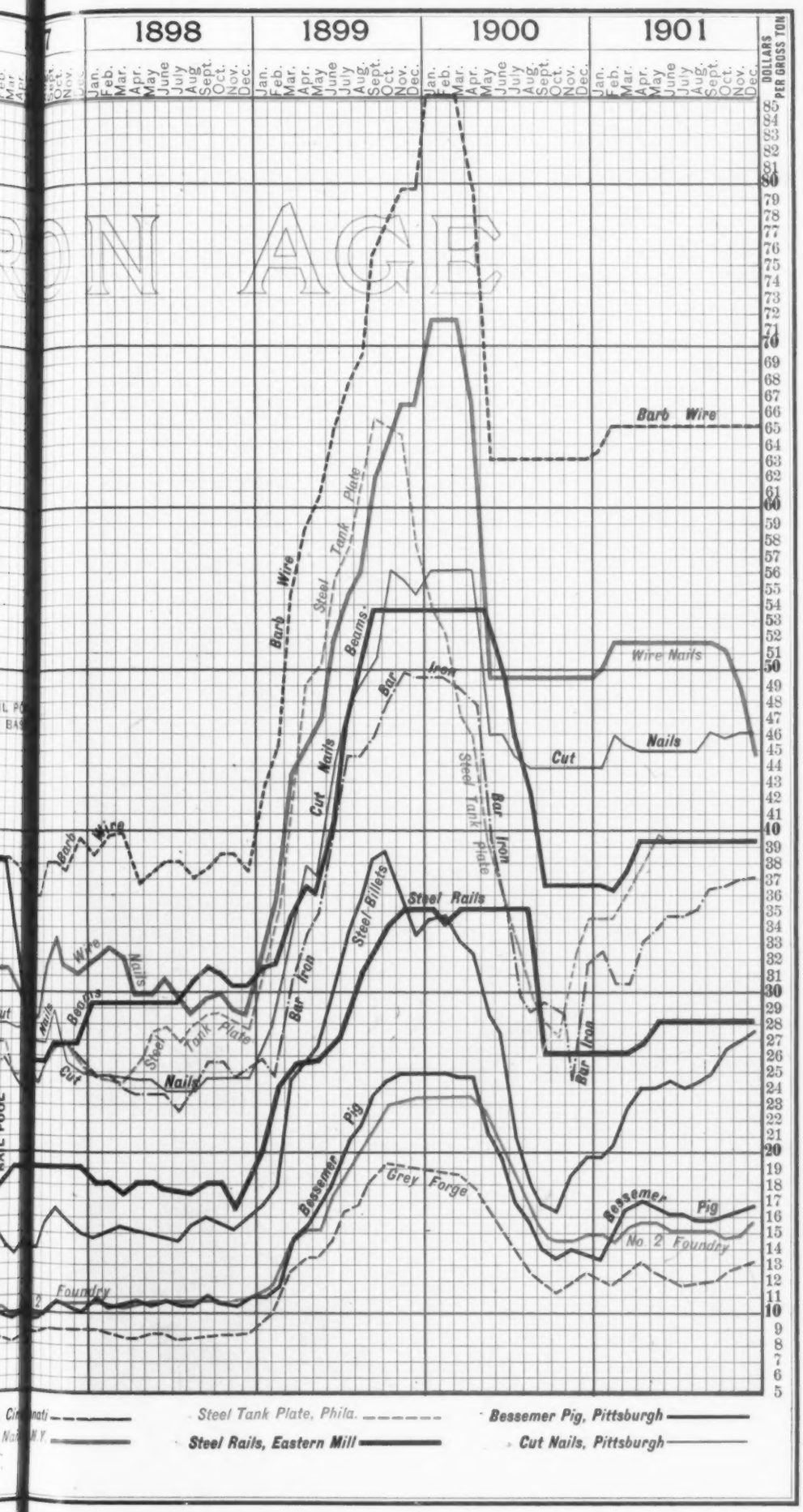
WITZENMANN METAL HOSE.

The single hose is made in three styles. As shown in Fig. 1, the packing is of rubber and lies between the overlapping edges of the metal tape. This hose is made only for light work, such as the conveying of gas, and for discharge pipes on which the pressure is light. The single hose is also made packed with asbestos, the packing being held firmly in a groove of the tape, instead of simply lying between the overlapping edges. This tubing is designed for higher pressures and for other purposes for which the first would not be suitable. The double hose, shown in Fig. 2, is intended for steam. This hose is constructed of two tubes, one inserted within the other, and firmly fastened at the ends. The coils of these tubes are in opposite directions. While the coils of the single tubing may become intwisted from careless handling, or when subjected to great strain, this cannot happen with the double tubing. The double hose can be made in special cases to withstand a pressure up to 3000 pounds per square inch.

Months.	Bessemer Pig.	Steel Billets.	Southern Grey Forge.	Local No. 2 Foundry.
1893				
Jan.	13.46	21.56	11.50	13.37
Feb.	13.32	21.62	11.12	12.81
March	13.63	22.60	10.90	13.00
April	13.65	22.44	10.75	13.00
May	13.41	21.69	10.69	12.96
June	13.37	21.70	10.50	13.00
July	13.07	21.06	10.44	12.79
Aug.	12.57	20.45	10.15	12.75
Sept.	12.16	19.31	9.94	12.75
Oct.	11.44	18.06	9.75	12.75
Nov.	11.17	17.37	9.80	12.75
Dec.	10.87	16.69	9.94	11.69
1894				
Jan.	10.66	16.12	9.75	12.50
Feb.	10.61	15.75	9.44	11.87
March	10.40	15.55	9.00	11.30
April	10.39	15.69	8.50	10.50
May	12.00	18.00	8.50	10.50
June	12.31	18.12	8.62	10.50
July	11.70	18.00	8.75	10.12
Aug.	11.71	17.15	8.80	10.00
Sept.	11.29	17.19	8.75	10.00
Oct.	10.89	16.00	8.75	10.00
Nov.	10.61	15.57	8.50	9.70
Dec.	10.20	15.12	8.37	9.75
1895				
Jan.	9.93	14.90	8.25	9.75
Feb.	10.07	14.95	8.25	9.75
March	10.19	14.84	8.25	9.81
April.	10.68	15.44	8.25	10.25
May	11.64	16.30	8.75	10.25
June	12.33	18.63	9.88	10.88
July	14.38	20.75	11.38	12.13
Aug.	14.63	21.75	11.50	13.20
Sept.	17.02	24.00	12.50	13.63
Oct.	15.45	21.90	12.50	14.00
Nov.	13.72	19.13	12.50	14.00
Dec.	12.67	16.97	12.25	14.00
1896				
Jan.	12.00	16.80	10.55	13.55
Feb.	12.63	17.38	9.75	12.50
March	12.32	17.09	9.58	12.00
April	13.10	19.53	9.35	12.00
May	12.64	19.50	9.50	11.69
June	12.35	19.12	9.44	11.50
July	11.88	18.85	9.00	11.25
Aug.	10.95	18.75	8.75	11.18
Sept.	11.25	19.75	9.00	10.75
Oct.	11.62	19.75	9.20	10.88
Nov.	12.05	20.00	9.94	11.19
Dec.	11.24	17.50	9.60	11.25
1897				
Jan	10.56	15.42	9.31	11.02
Feb.	10.60	15.25	9.00	11.00
March	10.52	15.44	8.94	10.88
April	9.82	14.60	8.40	10.75
May	9.32	13.82	8.19	10.38
June	9.56	14.06	8.25	10.25
July	9.25	14.00	8.45	10.25
Aug.	9.33	14.00	8.45	10.25
Sept.	10.09	15.60	8.80	10.40
Oct.	10.45	16.44	9.00	11.00
Nov.	10.23	15.57	9.00	11.00
Dec.	10.01	15.00	9.00	11.00
1898				
Jan.	9.87	14.93	9.00	11.00
Feb.	10.05	15.06	8.75	10.93
March	10.39	15.25	8.55	10.75
April	10.41	15.06	8.50	10.91
May	10.30	14.85	8.62	11.00
June	10.34	14.65	8.55	11.00
July	10.25	14.50	8.38	11.00
Aug.	10.35	15.85	8.37	11.00
Sept.	10.78	16.00	8.55	11.00
Oct.	10.36	15.56	8.75	11.00
Nov.	10.15	15.06	8.75	11.00
Dec.	10.58	15.80	8.90	11.00
1899				
Jan.	10.87	16.62	9.56	11.12
Feb.	11.60	18.00	10.42	12.12
March	14.59	24.30	12.70	14.60
April	15.03	25.37	13.25	15.12
May	16.20	26.75	13.43	15.37
June	18.51	30.10	14.85	17.60
July	20.65	33.12	16.06	18.87
Aug.	21.75	35.40	16.70	20.30
Sept.	23.43	38.37	18.43	21.87
Oct.	24.18	38.75	19.31	23.00
Nov.	24.78	36.50	19.05	23.10
Dec.	24.90	33.75	19.00	23.50
1900				
Jan.	24.90	34.50	18.93	23.50
Feb.	24.80	34.87	18.75	23.50
March	24.72	33.00	18.40	23.50
April	24.70	32.00	18.18	23.37
May	21.00	28.90	17.35	22.30
June	19.72	27.25	16.00	20.37
July	16.75	21.00	14.31	18.25
Aug.	15.60	18.20	12.35	15.90
Sept.	13.87	16.93	11.87	15.00
Oct.	13.06	16.50	11.31	14.50
Nov.	13.48	18.95	11.90	14.50
Dec.	13.43	19.75	12.50	14.75
1901				
Jan.	13.15	19.75	12.15	14.75
Feb.	14.43	20.31	11.75	14.25
March	16.31	22.88	12.63	15.25
April	16.75	24.00	13.25	15.50
May	16.30	24.00	12.50	15.50
June	16.00	24.38	12.00	15.00
July	16.00	24.00	11.75	15.00
Aug.	15.75	24.20	11.95	15.00
Sept.	15.75	24.88	12.06	15.00
Oct.	15.89	26.70	12.75	14.75
Nov.	16.00	27.00	13.00	14.88
Dec.	16.31	27.50	13.25	15.50



FLUCTUATIONS IN THE PRICES OF C
FROM JANUARY 1, 189



Months.	Cut Nails.	Steel Tank Plate.	Beams.	Bar Iron.	Barb Wire.	Wire Nails
1893						
Jan.	1.42	1.85	2.00	1.65	2.37	1.37
Feb.	1.42	1.82	2.00	1.65	2.40	1.39
March	1.15	1.80	2.00	1.63	2.42	1.50
April	1.15	1.80	2.00	1.62	2.45	1.55
May	1.10	1.80	2.00	1.62	2.45	1.51
June	1.05	1.75	2.00	1.61	2.45	1.39
July	1.05	1.70	1.85	1.60	2.45	1.35
Aug.	1.05	1.70	1.80	1.60	2.45	1.44
Sept.	1 00	1.65	1.80	1.55	2.40	1.45
Oct.	1.00	1.60	1.80	1.55	2.26	1.30
Nov.	1.00	1.55	1.75	1.49	2.15	1.18
Dec.	1.00	1.45	1.67	1.42	2.10	1.12
1894						
Jan.	0.95	1.42	1.59	1.41	2.05	1.10
Feb.	0.99	1.35	1.49	1.40	2.09	1.09
March	0.99	1.24	1.35	1.33	2.15	1.09
April	0.91	1.20	1.30	1.20	2.10	0.94
May	0.90	1.22	1.31	1.20	2.05	1.05
June	0.94	1.32	1.40	1.20	2.07	1.11
July	0.95	1.35	1.40	1.20	2.05	1.14
Aug.	0.90	1.27	1.40	1.22	2.05	1.07
Sept.	0.90	1.30	1.35	1.24	2.00	0.99
Oct.	0.85	1.29	1.30	1.16	1.99	0.99
Nov.	0.86	1.24	1.30	1.15	1.90	0.92
Dec.	0.80	1.25	1.30	1.11	1.85	0.85
1895						
Jan.	0.81	1.25	1.30	1.10	1.86	0.86
Feb.	0.80	1.21	1.30	1.15	1.89	0.90
March	0.76	1.20	1.30	1.15	1.89	0.94
April	0.70	1.20	1.30	1.15	1.83	0.87
May	0.81	1.24	1.31	1.15	1.81	0.97
June	1.19	1.39	1.43	1.16	1.89	1.27
July	*1.43	1.68	1.65	1.28	2.00	*1.68
Aug.	1.80	1.81	1.66	1.50	2.40	2.05
Sept.	1.96	1.95	1.82	1.46	2.70	2.25
Oct.	2.00	1.81	1.75	1.44	2.70	2.25
Nov.	2.00	1.68	1.76	1.40	2.56	2.25
Dec.	*2.00	1.50	1.69	1.33	2.03	*2.25
1896						
Jan.	2.00	1.43	1.60	1.23	1.90	2.25
Feb.	2.00	1.40	1.50	1.24	1.89	2.25
March	2.15	1.40	1.55	1.23	1.85	2.40
April	2.21	1.44	1.60	1.18	1.97	2.46
May	2.30	1.45	1.68	1.20	2.00	2.55
June	2.30	1.40	1.70	1.20	1.95	2.55
July	2.30	1.38	1.76	1.20	1.87	2.55
Aug.	2.30	1.35	1.70	1.21	1.85	2.55
Sept.	2.30	1.31	1.70	1.20	1.80	2.55
Oct.	2.30	1.27	1.70	1.20	1.73	2.55
Nov.	2.09	1.25	1.70	1.20	1.76	2.29
Dec.	1.41	1.23	1.62	1.15	1.84	1.51
1897						
Jan.	1.28	1.20	1.70	1.15	1.76	1.39
Feb.	1.25	1.20	1.70	1.15	1.73	1.35
March	1.25	1.20	1.70	1.14	1.70	1.40
April	1.25	1.20	1.70	1.15	1.70	1.40
May	1.23	1.11	1.49	1.10	1.68	1.35
June	1.23	1.10	1.25	1.07	1.64	1.31
July	1.20	1.10	1.15	1.08	1.60	1.25
Aug.	1.19	1.08	1.15	1.08	1.60	1.26
Sept.	1.19	1.14	1.15	1.14	1.70	1.41
Oct.	1.28	1.15	1.20	1.19	1.70	1.49
Nov.	1.14	1.14	1.20	1.20	1.69	1.41
Dec.	1.12	1.13	1.20	1.15	1.75	1.39
1898						
Jan.	1.10	1.10	1.30	1.11	1.71	1.42
Feb.	1.10	1.10	1.30	1.11	1.73	1.45
March	1.10	1.08	1.30	1.06	1.77	1.43
April	1.08	1.12	1.30	1.05	1.65	1.31
May	1.08	1.21	1.30	1.05	1.66	1.31
June	1.06	1.23	1.30	1.05	1.70	1.35
July	1.06	1.20	1.30	1.00	1.70	1.31
Aug.	1.05	1.23	1.37	1.06	1.65	1.26
Sept.	1.08	1.27	1.40	1.14	1.67	1.32
Oct.	1.10	1.27	1.38	1.13	1.71	1.33
Nov.	1.10	1.25	1.35	1.10	1.71	1.28
Dec.	1.10	1.26	1.35	1.11	1.67	1.27
1899						
Jan.	1.18	1.35	1.40	1.15	1.88	1.43
Feb.	1.32	1.55	1.42	1.20	2.02	1.57
March	1.48	1.89	1.55	1.41	2.42	1.94
April	1.67	2.18	1.64	1.50	2.60	2.05
May	1.65	2.23	1.63	1.56	2.70	2.10
June	1.97	2.48	1.82	1.81	2.90	2.30
July	2.12	2.58	2.08	2.00	3.02	2.42
Aug.	2.20	2.72	2.20	2.00	3.10	2.50
Sept.	2.45	2.92	2.40	2.05	3.36	2.76
Oct.	2.50	3.00	2.40	2.13	3.47	2.87
Nov.	2.48	2.87	2.40	2.21	3.55	2.93
Dec.	2.45	2.48	2.40	2.20	3.55	2.95
1900						
Jan.	2.50	2.38	2.40	2.20	3.80	3.20
Feb.	2.50	2.32	2.40	2.20	3.80	3.20
March	2.50	2.10	2.40	2.18	3.80	3.20
April	2.50	2.02	2.40	2.12	3.55	2.93
May	2.05	1.75	2.40	1.77	2.80	2.20
June	2.05	1.60	2.22	1.56	2.80	2.20
July	1.97	1.37	2.05	1.33	2.80	2.20
Aug.	1.95	1.30	1.89	1.28	2.80	2.20
Sept.	1.95	1.25	1.65	1.30	2.80	2.20
Oct.	1.95	1.21	1.65	1.28	2.80	2.20
Nov.	1.95	1.44	1.65	1.28	2.80	2.20
Dec.	1.95	1.54	1.65	1.42	2.80	2.20
1901						
Jan.	1.95	1.55	1.65	1.44	2.82	2.22
Feb.	2.05	1.55	1.63	1.35	2.90	2.30
March	2.01	1.62	1.66	1.35	2.90	2.30
April	2.00	1.76	1.75	1.47	2.90	2.30
May	2.00	1.78	1.75	1.51	2.90	2.30
June	2.00	1.75	1.75	1.55	2.90	2.30
July	2.00	1.75	1.75	1.55	2.90	2.30
Aug.	2.00	1.75	1.75	1.56	2.90	2.30
Sept.	2.05	1.75	1.75	1.61	2.90	2.30
Oct.	2.04	1.75	1.75	1.62	2.90	2.28
Nov.	2.05	1.75	1.75	1.64	2.90	2.17
Dec.	2.05	1.75	1.75	1.65	2.90	1.99

* Change of base.

UDE AND FINISHED IRON AND STEEL

, TO JANUARY 1, 1902.

Press for Copper Banding Shells.

Projectiles for guns are fitted nowadays, as most of our readers are aware, says the London *Engineer*, with a copper driving band. This is a copper strip of a width varying with the size of the projectile, rolled or pressed into a groove made for its reception near the base of the shell. It is slightly tapered or beveled toward the front, so that it may be driven by the gas pressure into the rifling. It serves a double purpose. By engaging with the rifling of the gun it gives rotation to the projectile, and at the same time by its expansion into the bore it acts as a gas check and reduces the erosion of the gun by minimizing the escape of gas round the shell.

From these introductory remarks it will be seen that the following are the essential features of a properly fixed band: 1. It must be pressed so firmly on the shell that every portion of it is home in the groove, completely filling the under cuts, and so that the serrated projecting vees on the shell, arranged to prevent the ring rotating without the projectile, are firmly imbedded in the copper. 2. All the portions of the band should be equally compressed, so as to possess the same degree of density. 3. While the band must be pressed on with sufficient power to fulfill condition 1, the shell itself must not be upset enough to prevent the easy insertion of the screw gauge in the fuse seat in the base of the shell.

The usual methods of forcing the bands into the grooves are either the use of a pair of semicircular dies, brought together by a hydraulic ram, or forcing the shell through a conical die. The former method has the disadvantage of not compressing the band equally throughout its circumference; while the latter method has a tendency to cause the copper to flow toward the rear of the shell. Another objection to the use of the conical die is that the least variation in the thickness of the rough copper band has a corresponding effect on the degree of tightness with which the compressed band grips the shell.

In the press under notice the makers claim that the above disadvantages are conspicuous by their absence, and as this type of press is used at the shell factories, Woolwich, it would appear that the process was an advance in the right direction.

In this system a number of rams are arranged circumferentially on a bed plate, and capable of traveling toward a common center, and the principle of the shell

Fig. 1.—Plan.

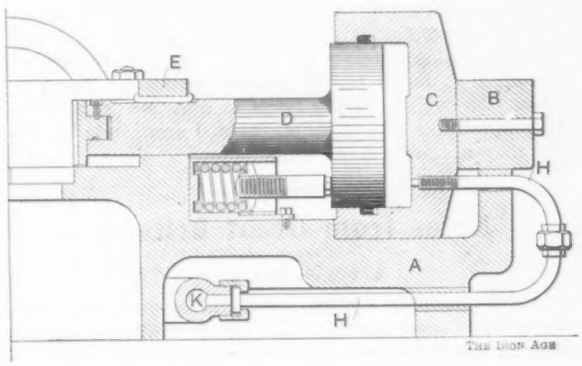


Fig. 2.—Section Through One Ram.

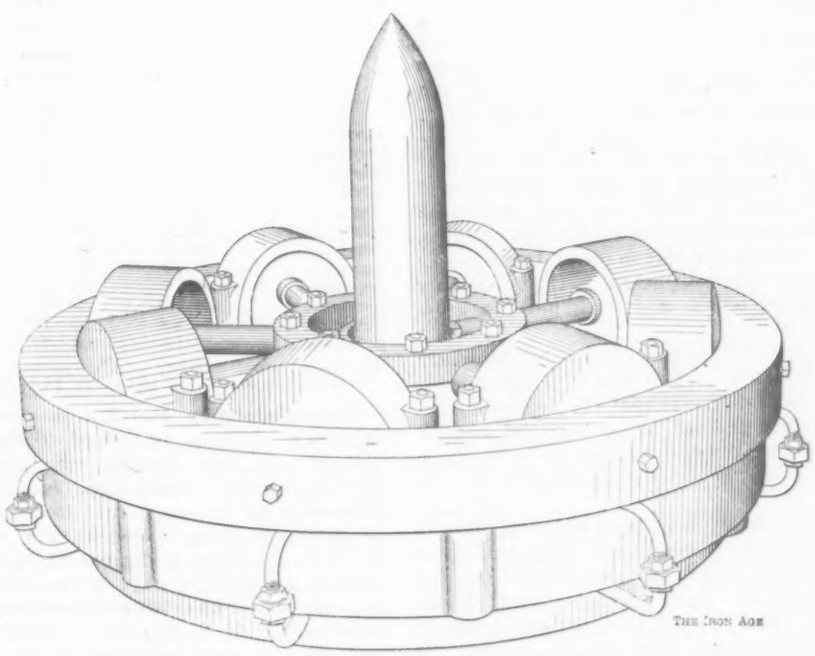


Fig. 3.

PRESS FOR COPPER BANDING SHELLS.

banding presses will be readily understood from the drawings, Fig. 3 being from a photograph of a press capable of banding shells from 4.7 inches to 12 inches in caliber. The following is a brief description of this size of press: A is a strong cast iron bed plate, circular in form, supporting a weldless rolled nickel steel ring, B, 9 inches deep and 8 inches broad; to the inner circumference of this ring are fixed eight steel cylinders, C, 15 inches in diameter, with S. M. steel rams, D, guided by means of a smaller ring, E, and carrying on their ends removable die blocks, curved to suit the periphery of copper band. Pressure is conveyed to the cylinder by means of radial pipes H, communicating with a common distributing chamber, K. The rams are all single acting, and their return is effected by the springs shown, one of which is placed under each ram.

Pressure is supplied by means of a two-throw belt driven pump, working up to 4500 pounds per square inch when pressing the largest sized bands, but in some cases the makers supply a small intensifier instead of the pump, so as to utilize existing hydraulic pressure mains. The weight of the press in question is 12 tons. The copper rings are, of course, turned accurately to size after they are pressed on.

Notes from Great Britain.

A Year's Work.

It will probably be said that the first signs of the 1904 trade depression in Great Britain showed themselves in the year 1901. Whatever may be its economic cause, there can be no shadow of doubt that trade moves in cycles, the rise and fall from maximum to minimum being anywhere between five and seven years. Some economists put it down to a natural periodical shortage of the world's raw material—wheat, corn, tea, cotton and ores. They tell us that there comes a period when the average supply of all these natural commodities shows a relative shortage to human demand, and that from this cause arises the swing of the pendulum. I confess the theory to me requires more proof than is yet forthcoming. Be this as it may, however, the observer is generally on the lookout for the turn in the affairs of trade, whether it be up or down. My own conclusion is that the year 1901 saw a distinct contraction of trade, witnessed the first panics not only in prices, but in stocks and shares, and that this contraction is the forerunner of a trade depression which will from now on grow *in crescendo*.

How far events have been precipitated by the costly continuance of the South African war it is difficult offhand to say. There is no doubt that the domestic market has been adversely affected, but an artificial demand has, upon the other hand, been created. It is too early yet accurately to gauge the exact economic effect of the war.

Two external influences have been at work. In the first place, the prosperity of the United States has saved English makers from American competition. On the other hand, however, as I have previously pointed out, the German trade crisis has led to a general slaughter of the market. This began last August, reached its culminating point about the middle of November, and is now slacking off. There are signs, indeed, that the German commercial statesmen are pulling themselves together.

One of the surest indications of the state of the market is to be found in the two-monthly ascertainments of the sliding scale committees. Thus, during the year wages have fallen 15 to 30 per cent. This decrease in wages has, of course, followed a decrease in prices. Our customers have not taken so much from us, our home demand has been less, and, as I have said above, the best word to apply to trade conditions during 1901 is "contraction."

Tin.

The worst market panics have been created in the copper and tin rings. All through the year the trade in tin has been irregular. The various interests in this market have at various times secured advantages which have turned out to be purely temporary. Speaking generally, there has been a retrograde movement on the year's work of £15 per ton. This is undoubtedly due to a sluggish market and to overproduction at the Straits. In this connection it must be remembered that the Dutch markets have been cutting the English prices, causing a transference from this country to Holland of European orders. In the earlier part of the year, owing mainly to large American purchases, the cash price touched £123 10s. By the end of March it had fallen to £115 5s. Just before this period large quantities of tin were transferred to New York to relieve the corner there, the bull operators being the winners. From March to the end of the year prices were on the decline the whole time. Financial troubles caused a temporary panic, the bottom price being £97 10s., but just before the end of the year there was a recovery, and the year closed with the price at £106 7s. 6d. cash for metal.

Iron and Steel.

The first signs of an approaching break in the trade was the action of the marked bar makers in the Midlands, who reduced their standard price from £10 10s. to £9 10s. This reduction was followed in May by a further reduction to £8 10s., that being the nominal price at the end of the year. What happened in Birmingham is typical of the general trend of the iron and steel trades in all the metal centers—in Barrow in Furness, Cleveland, Glasgow, the Hartlepools, Leeds, Newcastle, Sheffield, South Staffordshire and Sunderland. Equally true also of steel. Thus, steel angles have fallen from £7 5s. to £5 15s.; steel bars, £8 5s. to £6 10s., and steel plates from £7 5s. to £6. Until fuel has fallen much more than it has as yet, and wages are much lower, it may be assumed that these are very nearly bottom prices. The variations in the prices of pig iron are thus summarized by the *Iron and Coal Trades Review:*

	Scotch warrants.	Hematite warrants. West Coast.	Cleveland warrants.	No. 3 Cleveland.
	s. d.	s. d.	s. d.	s. d.
January	57 5	65 2	49 4½	50 0
February	52 7½	58 0	47 0	47 6
March	52 7	59 3	45 4	46 0
April	54 0	56 11	45 6	45 3
May	54 3½	57 4	45 5	45 9
June	53 6	57 6	45 2½	45 6
July	51 11	57 0	44 0	44 3
August	54 0	58 7	45 10½	46 0
September	53 8	61 3	44 11½	45 3
October	54 0½	59 11	45 6½	45 6
November	54 10	59 7	44 10	45 0
December	55 8	56 7	43 2	43 3
Average for year.	54 0 13-24	58 11 1-12	45 6 5-24	45 9¼

Notwithstanding the fall in prices, public stores show an increase of about 50,000 tons. Curiously enough, also, our imports from Canada of pig iron amount to about 50,000 tons. In this connection it is interesting to remember that in methods we are more nearly approaching America than ever before. Thus the Millom & Askam Company last year constructed a furnace designed by Axel Sahlin on the American plan at a cost of over $300,000, estimated to produce about 2000 tons weekly, or 100,000 tons a year, from 50 per cent. ore. This is about three times the average output of British blast furnaces. On this point the following quotation from the same journal is very pertinent:

"The primary and most serious difficulty facing the British iron industry is that of the production of cheap Bessemer or hematite iron. In 1897 the average price of this description of iron at works at Pittsburgh was a fraction over $10, or, say, 42 shillings, per ton. In the same year, 1897, American Bessemer pig averaged about 43 shillings 6 pence per ton, whereas at West Cumberland works it was 54 shillings 7 pence per ton for the same year. The prices of 1899 and 1900 are hardly any criterion of either costs or values, since they were inflated and fluctuating. What we have to face is the fact that the average price for this description of iron in 1897 and 1898 was about 9 shillings per ton less than the average in our own country.

"It was not until they got prices down to this low figure, and were thus placed in a position to produce

rails and other sorts of steel correspondingly low, that the American iron trade began to talk seriously of invading European markets. This movement may be said to have begun with 1897, and to be founded on cheap Bessemer pig. Its extension will depend more on that capacity than on any other. The question therefore arises, Will it be possible to cheapen the cost of hematite iron in Great Britain? Or, conversely, Is it probable that the cost of making American Bessemer iron will increase? It must be confessed that there is not much present likelihood of either event taking place, but meanwhile Bessemer pig iron at Pittsburgh has risen to $16 per ton (64 shillings 8 pence), against 57 shillings per ton on the West Coast, giving British Bessemer pig makers an advantage of nearly 8 shillings per ton, thus proving that in the pig iron industry one can never tell what a day, much less a year, may bring forth."

Prices and Production.

It is not necessary to enter into detail as to the strength or weakness of the trade during the past year in the several districts of England where such matters are vital. I, however, append a table, giving a comparison of prices as between January 3, 1901, and January 2, 1902. It is compiled by the *Iron and Coal Trades Review:*

	January 2, 1902.	January 3, 1901.
Iron Ore.		
	s. d.	s. d.
Rubio, Middlesbrough	15 9	18 0
Rubio, Cardiff	14 3	15 3
Pottery mine, N. Staffordshire	20 6	20 6
Hematite, West Coast (at mines)	16 0	19 6
Pig Iron.		
No. 3 Foundry, Middlesbrough	43 6	50 0
Warrants	43 4	49 4½
Scotch warrants, Glasgow	49 1	57 5
Hematite warrants, West Coast	55 6	65 2
Cold blast (foundry), S. Staffordshire	103 0	130 0
Welsh hematite, Cardiff	60 0	80 0
Manufactured Iron and Steel.		
	£ s. d.	£ s. d.
Marked bars, S. Staffordshire	8 10 0	9 10 0
Common bars	7 0 0	8 0 0
Steel rails, Middlesbrough	5 10 0	6 0 0
Steel rails, West Coast	5 10 0	6 5 0
Steel rails, Cardiff	5 0 0	6 0 0
Steel angles (eng.), Middlesbrough	6 0 0	7 2 6
Steel angles (eng.), Glasgow	5 12 6	7 0 0
Steel plates (ship), Middlesbrough	6 0 0	6 15 0
Steel plates (boiler), Glasgow	6 10 0	6 15 0
Tin plates, Bessemer IC cokes, So. Wales	13 0	13 3

As for the production of iron or pig iron and steel, the following comparison sums up all there is to be said as to the actual standing of the British iron and steel trade in relation to the rest of the world:

	Coal. Tons.	Iron ore. Tons.	Pig iron. Tons.	Steel. Tons.
Britain	225,181,300	14,028,208	8,959,691	5,050,000
United States	240,065,917	27,553,161	13,789,242	10,188,329
Germany	*149,551,058	18,964,367	8,520,390	6,365,259
Belgium	23,462,817	†201,445	1,018,507	‡654,827
France	*33,270,385	†4,985,702	2,699,494	1,660,118
Spain	2,773,000	8,480,246	294,118	†122,954
Sweden	252,320	2,609,500	526,868	300,536
Russia	16,137,736	.....	2,821,000	‡1,830,269
Austria-Hungary	*†38,738,372	3,293,003	1,308,490	1,145,654
Canada	4,925,051	122,000	86,090	23,577

* Includes lignite. † For 1899. ‡ Ingots only.

Britain and the United States are in gross tons, others in metric.

It should be borne in mind that as the figures under "Coal" in the case of Germany include lignite, the total does not represent the same relative calorific value.

Shipbuilding.

The moment we turn to shipbuilding a complete change in the general tenor of trade is observable. While the iron and steel and engineering sections have had an anxious time English shipbuilding has beaten all previous records, and this notwithstanding an adverse freight market. I observe in several quarters various attempts made to explain this curious fact. Hitherto, with the weakening of the freight market has come a corresponding slackening in shipbuilding. But not only have English shipbuilders beaten the world's record in 1901, but they still have an enormous amount of tonnage on contract, although not quite equal to last year's balance. Here, too, American competition has not been felt, although it is asserted on good authority that agents from America have recently approached more than one Clyde firm with proposals for absorbing or reconstructing their establishments under American auspices. Nor is it beyond the bounds of possibility that before many years have elapsed there may be a working combination between a shipbuilding yard on the Clyde and the American company, with their four establishments. The sum total of shipbuilding for the years 1901 and 1900 may thus be tabulated:

	1901. Vessels.	1901. Tons.	1901. I. H. P.	1900. Vessels.	1900. Tons.	1900. I. H. P.
Scotland	376	554,406	472,190	406	534,759	490,645
England	834	1,091,347	895,328	816	994,519	679,380
Ireland	23	151,922	109,300	26	131,431	67,600
	1,233	1,797,675	1,476,818	1,248	1,660,709	1,237,626
Foreign and colonial	870	857,690	769,813	694	733,734	705,182
Totals	2,103	2,655,365	2,246,631	1,942	2,394,443	1,942,808

From this it will be observed that considerably more than half of the world's increase in shipbuilding comes from Great Britain. It will be useful further to put on record the output of the six largest shipbuilding firms in the world, together with their tonnage (Board of Trade) for the year 1901. They are as follows:

	B. T. tons.
Harland & Wolff, Belfast	92,316
W. Gray & Co., Hartlepool	82,262
American Company (four establishments)	81,681
Russell & Co., Port Glasgow	58,387
Palmer's Company, Newcastle-on-Tyne	51,292
John Brown & Co., Clydebank	49,800

Particular notice should be taken of the work done by Harland & Wolff of Belfast. These vessels are as follows, the "Kronprinz Wilhelm" being added to the list to show the size of some of the vessels by contrast:

	B. T. tons.	Builders of vessel.
Celtic	20,904	Harland & Wolff, Belfast.
Kronprinz Wilhelm	14,908	Vulcan & Co., Stettin.
Minnetonka	13,546	Harland & Wolff, Belfast.
Athenic	12,512	Harland & Wolff, Belfast.
Walmer Castle	12,482	Harland & Wolff, Belfast.
Noordam	12,480	Harland & Wolff, Belfast.

I question if there is any industry in the world which aims at such a high state of efficiency as the shipbuilding industry of Great Britain. Professor Biles, writing last week, remarks that the number of men capable of making good work in the shipbuilding trades is comparatively small in proportion to the total number of riveters available, and while the number of large ships is growing, the supply of men capable of working the largest rivets is decreasing. Therefore, says he, we must either change our methods of constructing ships or displace the human machine. The limit has been reached, and we must have pneumatic or other riveting apparatus which will not be so easily limited in its power of doing good work. Probably with the introduction of pneumatic riveting the methods of closing the work for riveting will have to be altered, as they have been in America, and with the introduction of these methods it will certainly be found that though the limit of manual labor has been reached the limit of the capability of the British workman is still far off. Finally I may put on record that the value of new ships made in Great Britain and not registered as British during the year 1901 amounted to nearly $46,000,000 in value, being an increase of nearly $3,000,000 on the year 1900.

Engineering.

Little of importance need be related of the British engineering industry during the year that has gone. Officially the most interesting event was the technical committee appointed to report on the Belleville and other boilers in use in the British Navy. The decision went out against the Belleville boiler, although not specifically against the Belleville type. In any event, the naval authorities still seem wedded to the water tube boiler and advance excellent reasons for their preference. So far as the home market is concerned, no great engineering feat was accomplished, and whatever activity there has been in the engineering shops has been on foreign account, but both the home and foreign engineering trade of England show considerable falling off from the year 1900. Thus, machinery and mill work

exported amounted to £17,855,335, compared with £19,619,784 in the year 1900, a decrease of £1,764,449.

The Export Trade.

The exports of metals and articles manufactured therefrom, excluding machinery and ships, amounted last year to £39,413,762, compared with £45,346,909 in the year 1900, showing the enormous decrease of close upon £6,000,000. Those figures tell the tale better than any words. The following are the leading items in the exports of Great Britain of metals, both in volume and value:

	Volume.		Value.	
	1900.	1901.	1900.	1901.
Brass .....Cwts.	120,788	116,362	£631,015	£593,681
Copper, unwrought. "	360,726	533,076	1,397,495	1,961,290
Copper, wrought.... "	211,915	221,989	942,219	957,188
Iron: Pig.....Tons.	1,427,525	839,223	5,994,306	2,631,746
Bar, angle, bolt and rod ..... "	157,164	117,848	1,543,143	1,041,367
Iron and Steel:				
Railroad of all sorts ..... "	463,731	574,656	3,192,067	3,654,421
Hoops ..... "	.....	39,407	.....	349,372
Sheets and boiler plates ..... "	.....	35,231	.....	324,100
Armor plates..... "	.....	745	.....	81,723
Cast and wrought iron and all manufactures, unenumerated, except ordnance "	338,637	322,168	5,868,174	5,043,795
Steel, unwrought. "	308,448	213,127	3,684,065	2,367,134
Manufactures of steel or of steel and iron combined ..... "	2,451	51,811	1,022,329	1,135,548
Lead:				
Pig, and manufactures of..... "	35,989	37,634	689,760	586,707
Tin, unwrought..Cwts.	112,389	109,910	762,764	680,347
Steam engines:				
Locomotives			1,496,849	1,949,910
Agricultural			755,505	612,680
Other descriptions.....			1,842,987	1,711,098
Machinery and mill work, not steam engines:				
Agricultural			872,636	732,732
Mining			561,557	509,562
Textile			6,214,245	4,732,545
Other descriptions.....			6,424,005	6,054,560

Future Prospects.

The feeling is very prevalent in Great Britain that in the near future trade will improve. It is argued that immediately after the settlement of the South African War there will be a greatly enhanced demand for all kinds of goods, but more particularly for bridge work, mining machinery and metal goods generally. On this point I would only observe that the war seems by no means over; that it may continue for another two years; that even if it ended to-morrow, the prostration of both the Dutch and English races in South Afrfica is bound to have its effect upon trade and finance; that probably £400,000,000 has been or will be spent; and that, therefore—at least so I personally argue—the probabilities are that after the immediately necessary repairs have been made good in South Africa a period of stagnation will follow which cannot fail adversely to affect the British market. In addition it ought also to be remembered that bitter racial feelings have been engendered and that a considerable portion of the population in South Africa will take care to purchase their various commodities from Germany and America in preference to England. American mining and mechanical engineers are influential in the Rand district, and they have a knack of preferring their own country's products to any other. Apart from South Africa, an examination of the world's probable market hardly leads me to the optimistic conclusion which, as I have indicated, is held by many over here. While the Indian trade will doubtless be maintained and developed, the process will be a slow one. The Australasian market is at the present moment an uncertain quantity, and the economic effects of the new tariff have yet to be weighed in the balances. Thus, while in duty bound placing on record the opinion held by many substantial business men that 1902 will be a better year than 1901, my own personal prophecy is that the year which we have now entered will in all probability show worse all-round results. Something, of course, depends upon the continuance of good trade in the United States. We have felt keenly the competition of Germans in this market during the past six months. But German competition will be but a fleabite compared with American competition when it arrives, and I am inclined to think that it will arrive sooner than most British manufacturers anticipate. As a prophet, on this occasion, I am a pessimist. S. G. H.

A New Expansion Bolt for Electrical Work.

Necessity has again shown the advantage of special designs of expansion bolts. We illustrate herewith a new hollow expansion bolt manufactured by the Steward & Romaine Mfg. Company of Philadelphia, Pa.

NEW EXPANSION BOLT FOR ELECTRICAL WORK.

These bolts are used for fastening arc lights and electrical fixtures to walls or arches of all kinds. Being hollow, the electric wires are run through the center of the bolt into or through the walls, as shown in the cut.

Shenango Valley Notes.

NEW CASTLE, PA., January 20, 1902.—Press dispatches appear to indicate that capitalists closely connected with the United States Steel Corporation are obtaining a controlling interest in all the electric railway properties of the Mahoning and Shenango valleys. The Sharon & Youngstown Electric Railway, Light & Power Company have been financed and brought to their present high efficiency largely by the efforts of H. W. Whipple, of the New York Security & Trust Company, in which C. M. Schwab has recently been elected a director.

The Mahoning Valley Railway Company, who have a line from Warren, Ohio, to New Castle, Pa., are now being reported as sold to a syndicate of which C. M. Schwab and John D. Rockfeller are at the head. There is thought to be some foundation for the rumor, as the Mahoning Valley line is said to have been on the market for some time. They have been building their extension from Lowellville to New Castle the past summer and fall, and it has been currently reported that new capital in large amounts was becoming interested in the company. The syndicate in charge of the Sharon-Youngstown lines has been known as the Penhale-Deavitt syndicate, and H. W. Whipple, manager of the bond department of the New York Security & Trust Company, has been its president. If the electric lines, with the light and power and gas interests closely associated with them, pass into the control of one syndicate, the amount involved will be fully $6,000,000, and the combination will be the largest ever effected in the affairs of Mahoning and Shenango valleys.

A surface indication of the unification of these important interests is the apparent settlement of suits over right of way and franchises, formerly pushed with vigor between the companies which will be included in the combination. The Sharon-Youngstown line is now only single track, but a bond issue has been authorized to build the second track.

Hubbard & Co., with general offices in the Hamilton Building, Pittsburgh, and works at Sixty-second and Butler streets, in that city, have recently gone into the manufacture of telegraph and telephone line construction materials. These consist of cross arm braces, carriage bolts, washers, lag screws, pole steps, guy rods and guy clamps. The above are all galvanized goods. The concern also make messenger clamps, pole clamps, digging bars, construction tools, &c., and have already entered quite a number of orders for these lines.

The Iron Age

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JOHN S. KING, - - - - - - - - - BUSINESS MANAGER.

Wireless Telegraphy.

During the past fortnight a great deal of attention has been focalized upon Signor Guglielmo Marconi. During his brief visit to this country following his marvelous achievement of exchanging across some 2000 miles of ocean prearranged electrical signals in predetermined order and frequency, he charmed every one with whom he came in contact. At the dinner arranged in his honor by the American Institute of Electrical Engineers he spoke with such modesty and was so careful to divide the honors which he might have monopolized with those, both living and dead, who had broken paths for his later work by original investigation, that he disarmed criticism and left a delightful impression on the minds of all who were so fortunate as to meet him. It may be truthfully said that all in his profession recognize the great value of the work he has already done, and wish him the fullest attainable measure of success in his efforts to reduce his invention to a commercial basis.

In establishing beyond controversy the fact that electrical communication could be established and maintained without artificial conductors across the Atlantic Ocean Marconi has done a great and permanently useful work. What was accomplished at St. Johns, however, was not intended to be final nor to offer a basis for commercial exploitation. It was strictly scientific and preliminary. Its announcement was premature, and to a great extent unauthorized. Before leaving England he arranged with the electrician in charge of the Cornwall station to begin sending signals daily at a given time when he should receive word to do so. On December 9 Marconi instructed his agent at Poldhu to begin sending signals at 3 p.m. daily and continue until 6 p.m. During these hours Marconi raised a kite with an aerial wire, and by this arrangement the prearranged signals were received exactly as directed. This established the principle, but between the results claimed by Marconi and anything like a commercial development of his invention lies a vast and, as yet, unexplored field of mechanical invention which he has no disposition to underrate. Its riddles may be solved and its difficulties overcome, but it by no means follows, nor is it probable, that wireless telegraphy will ever be so perfected as to enter into successful commercial competition with telegraphy by means of a metallic conductor.

The greatest distance by which intelligible messages have hitherto been transmitted by the Marconi system is between St. Catherines, on the Isle of Wight, and the Lizard, a distance of 186 miles. Marconi claims to have transmitted messages 200 miles between ships, and his statements are not questioned, although the details are not at the moment available. From this it would be safe to reason that distances ten times greater can be traversed if the proper appliances are provided, but this means the employment of great electromotive force to send the Hertzian waves circling to such incredible distances and receiving instruments of exceptional sensitiveness, so perfectly attuned as to surpass in accuracy of adjustment anything hitherto known or contemplated. It also remains to be determined experimentally to what extent, with everything as perfect as is mechanically possible, fog banks, electrical disturbances of the atmosphere, low lying clouds and storms will disturb or render useless the working of the system. Perhaps more difficult problems have been solved; whether this will be is still a matter of speculation.

That Marconi should be ambitious of the honors and profits of transoceanic telegraphy is natural enough, and it must be admitted that he is working to that end in the systematic way in which great results in the field of mechanics are invariably achieved. If, however, he should fall short of this result, his fame would still rest upon the secure basis of his acknowledged achievements. He has made wireless telegraphy a valuable adjunct and supplement to the established systems of electrical communication, as across wide stretches of water not traversed by cables and between ships and shore where no other form of communication is possible. If it does not become a destructive competitor with telegraphy by means of metallic conductors it will supplement it so valuably as to make itself what room is needed for a development of the greatest scientific and technical value

The Contraction of Bank Circulation.

Heavy withdrawals of circulation by several large banks in New York and Chicago have directed attention to one of the weakest features in our national bank system, although the new circulation issued to some banks has partly offset the withdrawals referred to. The maximum amount that the law allows to be withdrawn in one month was withdrawn in the first week of December and in the first week of January, and already notices have been served of the proposed withdrawals of the maximum amount that may be retired in February, and a substantial part of that which may be withdrawn in March.

In the winter, after the "crops have been moved," the need of circulation decreases, but this contraction began in the fall, when there is the most active demand for money, and was not checked by pretty stiff rates for call loans. In round millions the national bank circulation was $350,000,000 on April 1, and $360,000,000 on December 1, an increase of less than 3 per cent., during which period the circulation of the Canadian banks increased about 21 per cent., reaching on December 1 the high point of 85 per cent. of the paid in capital stock, while the circulation of American national banks was not quite 50 per cent. at the date of the last report of the Comptroller of the Currency.

But the statement of the whole amount of national bank circulation does not tell the whole story. A bank that wishes to sell its bonds deposits United States notes in their place as security for its outstanding notes. Then its bonds are returned to it and its notes are redeemed out of its deposit of lawful money. Between September 30 and November 30 the bank notes secured by bonds decreased $2,632,881, the amount secured by legal tender notes—that is, in process of being retired—increased over $3,500,000, and there was an increase of nearly a million dollars in the aggregate amount of bank circulation outstanding. During September and October the circulation of the Canadian banks increased a little more than $1,700,000 while the circulation of American national bank notes secured by bonds declined over $2,600,000 and the need of currency was growing greater.

The banks that have retired their circulation have explained frankly that it was due to the profit to be ob-

tained by selling their bonds. It is this contraction of the currency at a time when the need of money is increasing that occasions the demand from nearly all financial authorities for the issue of notes against the general assets of the banks, as in Canada, instead of against a deposit of bonds. Mr. Gage's very moderate proposition is to allow banks to issue circulating notes secured in part by a bond deposit and in part by the bank's assets.

The Barometer of the Iron Trade.

Under prevailing circumstances the condition of the iron trade is best reflected by the developments in that branch of it which concerns itself with foundry pig iron. The reason is obvious. On the one side we have a very large number of producers absolutely independent of one another, and on the other there are over 4000 consumers, large and small, whose work touches a vast variety of general consumptive requirements. In the steel trade and in nearly all branches of the rolling mill industry there has been such a concentration of interests that it is not usually an easy matter to gauge actual conditions. Events have their free play in the foundry iron trade.

A good deal of anxiety has been displayed lest the iron industry be overtaken by another "boom period," and manufacturers generally show a disposition to apply the brake in order to head off such a contingency, which is regarded as dangerous. A study of the situation in foundry pig iron does not indicate that it is imminent. Both consumption and production are on a very large scale and the position is exceptionally strong. A moderate upward movement has taken place and purchases have been made far into the current year, but there seems little danger of a buyers' scare, which, after all, is the cause of booms. Additional capacity is being prepared for work, which will aid in augmenting the supply.

Surprise has been frequently expressed at the fact that American blast furnace managers have not taken hold more promptly of the utilization of waste blast furnace gas for driving electrical machinery and for operating blowing engines. In fact, Continental engineers have shown an inclination to sneer at our claims to be progressive metallurgists, and point to our indifference to developments in this direction, accusing us of being as slow as the English. The ironmasters of the Continent have encountered troubles of their own, notably in the problem of getting rid of the dust in the waste furnace gas. If they had a heavy percentage of fine Mesaba ore in their burden, like the majority of the furnaces in the Central West, they would be very slow to adopt gas engines until the dust question is thoroughly settled. Still, we understand that a number of engineers have studied the question and that at least one company have begun by ordering a large German gas engine for experimental purposes.

Schaffer on Strikes.—A mass meeting of members of the Amalgamated Association of Iron, Steel and Tin Plate Workers was held in Youngstown, Ohio, on Sunday afternoon, January 19. Members of lodges in the Mahoning and Shenango valleys were present, and the principal address was made by Theodore J. Schaffer, who is president of the Amalgamated Association. In referring to the strike of last summer, which ended in a disastrous defeat for organized labor, Mr. Schaffer said: "I am opposed to strikes, and declare to-day that in the one last summer both sides got more than they wanted, and there will not be another." Mr. Schaffer said that when the strike started the association had $72,000, had paid $200,000 in strike benefits and at present there was a balance of $100,000 in the treasury.

OBITUARY

WILLIAM M. SEYFERT.

William M. Seyfert, the last of a famous family of Eastern Pennsylvania iron manufacturers, died on January 18 at his home in Philadelphia, aged 81 years. He was stricken with paralysis about a year ago and never recovered from the attack. Mr. Seyfert was president of the Reading Iron Works of Reading, Pa., and was also actively interested in several commercial and industrial enterprises in Reading and Philadelphia. Mr. Seyfert came of an interesting ancestry. His great-grandfather, Henry Seyfert, in the eighteenth century left Alsace, and, coming to America, settled near Reading, espoused the cause of the Republic and became a Revolutionary soldier. In early manhood Mr. Seyfert participated in the construction of the Croton Aqueduct, in New York, John McManus, one of the contractors, being his brother-in-law. On the death of his father, Simon Seyfert, in 1848, one of the pioneers of the iron industry of Pennsylvania, he succeeded him as one of the stockholders and as president of what are now known as the Reading Iron Works. The firm of Seyfert, McManus & Co., consisting of William M. Seyfert and his brothers, Simon and Henry, and John McManus, transacted an enormous business during and after the Civil War, forging cannon for the Government and shipping their other manufactures throughout the whole country.

NOTES.

CHARLES PAXTON WILLIAMSON, a pioneer iron maker of Birmingham, Ala., died on January 20, aged 59 years. He was a native of New Richmond, Ohio. He worked in the shops of the Louisville, New Albany & Chicago Railroad when a lad at New Albany and served as a soldier for the Union in the Civil War. Mr. Williamson went to Birmingham in 1874 and was one of the organizers of the Linn Iron Works, one of the largest foundries in the city. In 1885 he was the prime mover in the organization of the Williamson Iron Works and built the Williamson Furnace. At the time of his death Mr. Williamson was president of the Williamson Iron Works.

JOHN FROTHINGHAM WARD, one of the best known of the older civil and mechanical engineers of the country, died January 16, at his home in New York City, at the age of 72 years. He was born in Vermont and had planned and carried out much large construction work in many parts of the country. Mr. Ward was for several years a director of the American Society of Civil Engineers. He invented the flexible joint for laying cast iron pipe under water.

UZAL OGDEN CRANE, for many years prominently identified with the pig iron trade of this country, died at his residence in New York City on January 14, at the age of 56 years. When 14 years old he entered business with the iron importing firm of Thomas J. Pope & Brother. In 1875, with his brother, Henry P. Crane, he formed the firm of U. O. Crane & Brother.

ANSON P. WATERMAN, who died at Beloit, Wis., January 8, aged 83, was an old hardwareman, having for many years conducted at Beloit one of the first hardware stores established in the Northwest. He was for a time also interested in the heavy hardware business in St. Louis. He was a native of South Ballston, N. Y.

NATHANIEL E. RUSSELL, formerly general manager of the Walter A. Wood Mowing & Reaping Machine Company, died January 16 at Troy, N. Y.

A New Galvanizing and Tinning Plant.—Scheeler's Sons of Buffalo, N. Y., proprietors of the Buffalo Wire Works, have found it necessary to add to their large establishment a galvanizing and tinning plant to galvanize their product of wire cloth. The new plant, known as the Buffalo Galvanizing & Tinning Works, Scheeler's Sons & Charles J. Vogt, proprietors, Buffalo, is in a position to do work for the general trade.

Central American News.

SAN JOSE, C. A., December 20, 1901.—All Nicaragua is willing to leave its bickerings to one side and vote for the retention of General Zelaya for the next presidential term—so he may be considered elected for the next four years, and thus help to push through the Nicaragua Canal matters. If the United States Government takes quick and stern action in regard to what I spoke of in my last—the grab game practiced in taking up Government lands on both sides (or banks) of the proposed canal—then our people will be saved an expense of millions of dollars; otherwise said sum will go to enrich a number of unscrupulous native officials.

Just as soon as our Government decides on one or the other route I expect an immigration of 50,000 Americans of all grades and classes in this vicinity. Within 90 days after this decision there will be more out and out American business concerns in Central America than ever there have been in all her history to date. Whatever way we take it, there is no denying the fact that the native Central American quickly adapts himself to and appreciates American methods. If he only has the money he is sure to buy American tools and American machinery. I will even go further and state that I have never seen them leave American goods for those of any other nation.

The rise in coffee prices and the greater cultivation of rice will cause an increased demand for our coffee and rice machinery from this quarter. If the reciprocity treaties are approved by our Congress all kinds of machinery, mining, agricultural and general industrial, will be admitted free to these republics.

There is a temporary lull in the building of Nicaragua's railroad from Greytown along the San Juan River to a point intersecting the proposed canal. They will probably rest on their oars till they see the outcome of present legislation at Washington.

The building up of the port of Limon has gone on briskly; most of the wharves and warehouses destroyed by the fire some time ago have been substantially rebuilt, and it is now proposed to construct another iron pier for the greater accommodation of big ocean liners, most of the wharfage now being taken up by the fruit steamers. C.

New Tin Plate Mill at McKeesport.—The McKeesport Mfg. Company, recently organized, intend to build a ten-mill tin plate plant at Port Vue, near McKeesport, Pa. Plans for the plant are being drawn by S. Diescher & Son, consulting engineers, Hamilton Building, Pittsburgh. The buildings will be of iron and steel construction and the mill building will be 210 x 350 feet, tinning and assorting building, 50 x 600 feet; boiler house, 40 x 150 feet; electric plant, 40 x 60 feet, and warehouse, 40 x 100 feet. The new plant will have direct connection with the Pittsburgh & Lake Erie Railroad. Contracts for most of the machinery have already been placed and the concern hope to be making tin and terne plate by September or October. E. R. Crawford will be general manager and J. E. Lauck will be superintendent. Both of these parties have been connected with the Demmler Works of the American Tin Plate Company for some years.

The Isabella Furnaces.—Very great improvements are being made at the Isabella furnaces of the American Steel Hoop Company, now under the control of the Carnegie Steel Company, at Pittsburgh. The stock yards are to be very much enlarged and new equipment added, while the size of the furnaces will be enlarged and the capacity more than doubled. These three furnaces heretofore have made only about 600 tons a day, but their combined capacity will be brought up to about 1200 tons a day. Hugh Kennedy and James R. Darragh, both of whom have been connected with this furnace plant for many years, have resigned.

New Blast Furnace at Sharpsville.—A corporation known as the North Side Iron Company have been organized at Sharpsville, Pa., and will erect a coke blast furnace at that place for the manufacture of pig iron. It was the original intention to call the concern the River Side Iron Company, but as that name had already been incorporated under in Pennsylvania, the name was changed to North Side Iron Company. The concern are composed of S. A. Robinson, C. B. Kantner, Andrew Nickle, C. S. Robinson, W. V. Robinson and H. W. Robinson, all of whom are residents of Sharpsville. Officers are S. A. Robinson, president; Andrew Nickle, vice-president, and C. B. Kentner, secretary and treasurer. We are advised that the plans are being drawn for the building of a blast furnace, and that it is the intention to start work at an early date.

The Columbia Bridge Company.—The capital stock of the Columbia Bridge Company of Pittsburgh, with works at Carnegie, Pa., has been increased from $100,000 to $300,000. Thomas Walker of the McVay & Walker Company, at Braddock, and Thomas W. Fitch, president of the Pittsburgh Steel Shafting Company, Rankin, have been added to the Board of Directors of the Columbia Bridge Company. It is the intention of the concern to increase their plant, and a building will be put up, in which rounds, squares, valleys and other shapes will be rolled, to be furnished to the Pittsburgh Steel Shafting Company, at Rankin.

United Wire & Supply Company.—The Burdon Wire & Supply Company of Providence, R. I., and the Standard Seamless Wire Company of Pawtucket, have consolidated their interests and incorporated under style of the United Wire & Supply Company, with offices at 109 Summer street, Providence. The capital stock of the new company is $2,000,000. The officers are Charles Sydney Smith, president; William B. Gladding, vice-president; Henry E. Smith, treasurer, and Henry T. Smith, general manager.

The Cresswell & Waters Company.—The Cresswell & Waters Company, Philadelphia, Pa., were recently formed by the consolidation of the David S. Cresswell and the Goodell & Waters iron foundries and were incorporated under the laws of the State of Pennsylvania; capital, $250,000. Both of the foundries named are well known to the trade, the Cresswell foundry having been established in 1840 by Samuel J. Cresswell, while the Goodell & Waters foundry was established in 1860. The officers of the new company are David S. Cresswell, president; Daniel A. Waters, vice-president and general manager; George M. Randle, treasurer. The directors are the officers as above stated, with Wm. W. Lobdell and V. W. Walter.

A New Bessemer Record.—The Bessemer department of the South Works of the Illinois Steel Company made 162 heats in 12 hours on the night turn of the 16th inst., turning out 1758 tons of ingots. The day turn on the same day made 143 heats, thus totaling 305 heats for 24 hours, which is claimed to be the best record ever made. The largest previous number of heats in 12 hours was 152.

The Troy Steel Plant.—The entire plant of the Troy Steel Company, including the three blast furnaces, the basic Bessemer steel plant, rolling mills and machine shops located on Breaker Island, near Troy, N. Y., is to be sold at public auction at Albany, N. Y., on February 11. F. S. Witherbee, 56 Pine street, New York, is receiver.

According to press reports official announcement has been made of the amalgamation of the firm of Vickers' Sons & Maxim, Sheffield, England, gun manufacturers, with William Beardmore & Co., manufacturers of armor plate and shipbuilding materials, of Glasgow. The joint capital is £6,300,000. William Beardmore & Co. own a big shipyard, and recently acquired ground for another, on which the amalgamated concern intend to install one of the finest plants in the world.

PERSONAL.

On January 14 Chauncey P. Goss celebrated the fortieth anniversary of his connection with the Scoville Mfg. Company of Waterbury, Conn.

W. E. Taylor, vice-president and general manager of the Republic Iron & Steel Company, has resigned, to take effect February 1.

At a special meeting of the trustees of the Carnegie Library of Braddock last week Thomas Morrison, general superintendent of the Edgar Thomson steel works and blast furnaces, was elected chairman, to succeed James Gayley, resigned. Mr. Gayley's resignation was due to his removal to New York.

R. Francis Wood has been elected a director of the Cambria Steel Company in the place of J. Lowber Welsh, who has resigned.

A. L. Hammarberg, who has been for some time chief engineer of the steel works department of the Tennessee Coal, Iron & Railroad Company, has resigned to accept the position of mechanical engineer with the Youngstown Iron, Sheet & Tube Company of Youngstown, Ohio.

W. B. Johnston, for a considerable period connected with the open hearth department of the South Chicago works of the Illinois Steel Company and recently secretary to the first vice-president, goes to the Tidewater Steel Company, Chester, Pa., on February 1 to fill an important position.

W. L. Simonton, general manager of the Emlyn Iron Works of East Chicago, has been appointed general manager of the Republic Iron & Steel Company, to succeed W. E. Taylor, resigned.

H. Prentiss Taylor of New York and San Francisco has been elected a director of the Cramp Steel Company, Limited.

An official inspection of the Midvale Steel Works, Nicetown, Pa., was made on Saturday by Rear Admiral Melville, engineer-in-chief of the United States Navy, who was accompanied by Lieutenant Galbraith, inspector of naval material, and Commander Willets of the Ordnance Department. The party were guided through the extensive plant by Vice-President James F. Sullivan, who fully explained the workings of each department. Following the inspection Vice-President Sullivan entertained the party at the Manheim Club, Germantown, where an elaborate luncheon was served, and where Admiral Melville gave some interesting reminiscences of his Arctic exploration.

W. A. Kingsley, sales manager of the American Steel Hoop Company at Chicago, has resigned for the purpose of engaging in another line of trade in the East. Mr. Kingsley has been connected with the company in a prominent capacity since the formation of the corporation. He was previously general manager of the Pomeroy Iron & Steel Company, at Pomeroy, Ohio. He will be succeeded by B. E. Hamilton, who has for some time been associated with him in the Chicago sales office.

Guy R. Johnson has resigned as blast furnace manager of the Sharon Steel Company, at Sharon, Pa., to accept a similar post with the Illinois Steel Company, at Joliet.

John K. Bryden of Darr, Luke & Moore has been elected a director of the Sharon Steel Company, Sharon, Pa.

At the annual meeting of the stockholders of the Pressed Steel Car Company, held in Pittsburgh on Wednesday, January 22, W. H. Schoen retired as first vice-president. It is said Mr. Schoen will not engage in active business for some time at least, but will give his attention to private interests.

Sherman Jones, formerly assistant superintendent of No. 3 open hearth plant at the Homestead Steel Works of the Carnegie Steel Company, has been appointed general superintendent of the basic open hearth plant at the Shoenberger Works of the American Steel & Wire Company, in Pittsburgh.

Henry C. Frick of Pittsburgh will build a magnificent hotel on property owned by him on Grant street and Sixth avenue in that city. It is said this hotel will be one of the finest structures in the United States, but will not be ready for guests for two years or more. D. H. Burnham, architect, of Chicago, who designed the Frick office building and the new Union Station in Pittsburgh, is drawing plans for Mr. Frick's new hotel.

The Power Plant for the St. Louis World's Fair.

ST. LOUIS, Mo., January 20, 1902.—One of the big problems in the construction of the World's Fair, to be held in St. Louis in 1903, has been solved; the contract for the construction of the enormous power plant was awarded last week to the Westinghouse Electric & Mfg. Company of Pittsburgh, Pa. The representative of that company in St. Louis states that the plant will cost $1,000,000, and will generate 10,667 horse-power. The total horse-power used by the fair will be about 25,000.

The Citizens' Electric Light & Power Company of St. Louis have also contracted with the exposition management to furnish about one-half of the total horse-power at a cost of between $400,000 and $500,000. The plant of the Westinghouse Company will be located in the Machinery Hall on the exposition grounds. The big generator will supply 400,000 incandescent lamps and 2000 arc lamps on the grounds.

The amount in cash paid by the Exposition Company on the Westinghouse contract will be $390,000. The machinery to be installed by the electric company will be redeemed by the Westinghouse Company after the fair, in partial payment on their expenditure of $1,000,000. The first of the machinery will arrive on the site December 1, 1902.

When the plant is finished it will be the largest single exhibit plant ever put into an exposition. It is proposed by the Exposition Company to use between 25,000 and 30,000 horse-power in lighting and moving the machinery of the exposition.

The contract awarded last week is for a plant complete and installed, including boilers, engines, generators, foundations, piping, cooling towers, smoke consuming devices, short stacks for mechanical draft and other equipment. The plant will include all the latest designs in up to date machinery, and will be a most useful and instructive exhibit. The boilers for this plant are to be located in a separate building 100 feet to the north of Machinery Hall. A tunnel is to lead the steam pipes from the boiler house to the engines. There will be no unsightly overhead pipes.

Consular Reform.

Copies of the following resolutions adopted by the Merchants' Association of New York City have been sent to the President, members of his Cabinet, to all members of Congress and to the leading commercial bodies throughout the country.

"*Whereas*, The production of manufactured articles in the United States has reached that point where it exceeds the domestic consumption, and thus the opening up of foreign markets has become absolutely essential to the future prosperity of the country; and

"*Whereas*, One of the most important channels for opening up and preserving this trade is the national consular service; and

"*Whereas*, A bill known as the Lodge bill has recently been introduced in Congress, providing for the reorganization of our consular service and the placing of the same upon a higher plane of efficiency; and

"*Whereas*, This association has for the past four years made consistent and persistent efforts toward this result; now, therefore, be it

"*Resolved*, That the Merchants' Association of New York hereby approves the Lodge bill for the reorganization of the consular service and urges upon the members of Congress its immediate passage."

The Michigan Stove Company of Detroit, originally incorporated in 1871, have renewed their corporate existence for 30 years and increased their stock from $300,-

MANUFACTURING.

Iron and Steel.

The wire drawing plant of the Norton Iron Works, at Ashland, Ky., is now in active operation. It has a daily capacity of 100 tons of wire and was built by the Morgan Construction Company of Worcester, Mass.

The New Process Mfg. Company of St. Louis, Mo., advise us that they have made large improvements at their wire mill which enable them to double the former capacity of the plant. They operate their wire drawing plant exclusively for converting the raw material into hay bale ties.

The St. Louis Steam Forge & Iron Works of St. Louis, Mo., large makers of car axles and every description of railroad and steamboat forgings, whose plant was destroyed by fire on March 18 last, have rebuilt on the old site and resumed in full operation on the 8th inst. In order to catch up on their orders in hand they are now working on double turn.

The Wheeling Steel & Iron Company, Wheeling, W. Va., have voluntarily advanced wages of their puddlers from $5.50 to $5.75 a ton, the increase dating back to January 1.

The Reading Iron Company of Reading, Pa., expect to blow in Crumwold Furnace, at Emaus, this week. It has been relined and the parts recently destroyed by fire rebuilt.

Car shortage and failure of railroad company to deliver cars already loaded with charcoal compelled Muirkirk Furnace, Md., to blow out January 8.

The Matthews Steel Casting Company have been incorporated with a capital stock of $50,000, and will erect an open hearth steel plant at Matthews, Ind. The incorporators are John Clifton of the Matthews Brick Company, George N. Catterson, secretary of the Matthews Land Company, and John H. Wood, president of the Matthews First National Bank. They propose to manufacture a general line of steel castings.

The Hollidaysburg Iron & Nail Company, Hollidaysburg, Pa., propose making extensive improvements to their plant. It is their intention to erect a new finishing mill, 100 x 200 feet, in which will be placed the heating furnaces, bar and guide mills, nail plate mill, engines, shears, straightening beds, and a complete department for the manufacture of mine rails of all sizes up to 40 pounds; to install 20 new puddling furnaces in present mill, and to largely increase capacity of nail mill. The cost of these improvements will approximate $50,000, and when completed the plant will be able to turn out a large tonnage of bar iron, mine rails, cut nails, &c.

By a deal just closed, the Cleveland Cliffs Company become the owner of the Au Train falls, Alger County, Mich., having purchased 40 acres of land on each side of the rapids. The falls proper are about 60 feet high, but in a distance of a mile above there is a fall of 200 feet or more. The advantages for harnessing the power are unsurpassed and there are reliable reports it is the intention of the company to erect manufacturing plants of some nature there. The company are the largest independent iron producers in the Lake Superior field, owning mines at Ishpeming, over 100 miles of railroad, furnaces at Marquette and Gladstone, and a lake fleet of 14 steamers.

Joseph Wharton of Philadelphia has begun the erection of a third blast furnace at Port Oram, N. J. It is understood that the greater part of the machinery has been purchased. The building of a modern open hearth steel plant may follow during the current year.

The recently organized Ohio Steel & Specialty Company, Cuyahoga Falls, Ohio, will commence operations about February 15. They will manufacture T irons, channels, light structural iron, stay bolts of various descriptions and angle irons. New machinery is being installed in the plant. Officers are E. A. Henry, president; Geo. W. Reid, vice-president; L. H. Whitcomb, secretary, and H. B. Hamlin, treasurer.

King & Tracy of Toledo, Ohio, proprietors of the Toledo Railway & Terminal Company, have announced that they have completed negotiations for the location in Toledo of a $1,000,000 blast furnace, to be completed during the year 1902. The furnace will be located on the east side of the Maumee River, on one of three tracts, options on which have been secured. They state that people outside of Toledo who are practical iron people are interested.

Directors of the Belfont Iron Works Company, Ironton, Ohio, have taken preliminary steps toward the erection of a large blast furnace, adjoining and similar to the present Belfont Furnace. The furnace will cost about $200,000.

The Enterprise Mfg. Company, Columbiana, Ohio, are building a gas producing outfit for the Sharon Steel Company, Sharon, Pa.

The Chicago Steel Mfg. Company have started up the old Lakeside Works at Hammond, Ind., and are now turning out shovel, tack and nail plate. In the course of a few days they will put the cut nail factory in operation and a little later they expect to go quite extensively into pressed steel specialties. The plant has been idle for several years, but is in excellent condition, and as it at one time played an important part in the Western hardware trade, the new management are confident that it will again take a conspicuous place in supplying the wants of that section. Frank M. Baldwin, widely known in the Western hardware trade, is vice-president and general manager.

General Machinery.

The Wichita Bridge Company, 321 South Market street, Wichita, Kan., will shortly be in the market for entire equipment of bridge building machinery. They have purchased a site upon which they will erect a plant for the manufacture of steel bridges. The necessary buildings are expected to be completed in 60 days.

The firm of Stephens, Adamson & Co., Aurora, Ill., manufacturers of power transmitting appliances, elevating and conveying machinery, &c., have incorporated their business under style of Stephens-Adamson Mfg. Company, with a capital stock of $35,000.

The Blakeslee Mfg. Company, manufacturers of steam pumps, Du Quoin, Ill., have secured a new charter, the old one having expired by limitation. The incorporators of the new company are A. J. Blakeslee, E. T. Blakeslee, C. E. Blakeslee and S. B. Eaton. The capital stock is $50,000.

Herbert J. Conn, William E. Currie, John A. Mercier and William L. Caswell have filed articles of association of the Peninsular Milled Screw Company, Detroit, Mich. Capital, $34,000.

Curry & Vannan, founders and machinists, Danville, Pa., report that during the whole year 1901 their force was kept fully employed and at the present time they are busy on contracts for structural iron. Within a few months they have supplied materials for a number of large buildings in New York City.

The Richard Mfg. Company, Bloomsburg, Pa., manufacturers of draw benches, presses, dies, emery grinders, &c., have added new machinery to their plant, including lathes, planers and drill presses, during the last two months, which nearly doubles their capacity. This has been rendered necessary by the expansion of their business. They have recently filled contracts for draw benches and wire machines, and have also done a considerable amount of work for the United States Government. F. J. Richard is general manager of the company.

The Jeansville Iron Works Company, Jeansville, Pa., have now, as for the past two years, great pressure of orders for mining and electric pumps. This, with the large amount of repairs made necessary in the pumps in many of the Pennsylvania mines by the December floods, has thrown work into the hands of the company beyond their capacity. No orders are now taken but with an allowance of six months in which to fill. It is intended to considerably enlarge the works this spring. The following is a partial list of contracts they have for the building of mining pumps: Lehigh Valley Coal Company, Hazelton, Pa.; Philadelphia & Reading Coal & Iron Company, for Tunnel Ridge Colliery, Pa.; G. W. Payne & Co., Luzerne, Pa.; M. C. Conkey, Joplin, Mo.; Delaware & Hudson Company, Scranton, Pa.; Cambria Steel Company, for mines near Johnstown, Pa.; Consolidated Coal Company, Frostburg, Md.; Alden Coal Company, Alden, Pa.; Arcadia Coal Company, Nova Scotia; Lehigh Valley Company, for Exeter Colliery, Pa.; Nova Scotia Steel Company, Sidney, N. S., and the H. C. Frick Company, Connellsville, Pa., two pumps. They have also contract for building four electric pumps for the Calumet & Hecla Copper Company, Calumet, Mich., and two electric pumps for the Denver Engineering Company, for a point in Mexico.

The Caldwell Electric Light Company, Caldwell, Ohio, will add new equipment to increase the capacity of their plant.

The Akron Mfg. Company, Akron, Ohio, have received a contract from the Carrara Paint Company, Barberton, Ohio, for 800,000 tin pails per year for five years. The contract will necessitate the addition of new machinery and a larger force.

The American Metal Wheel & Toy Company of Toledo have purchased the McLean glass factory and will equip it with new machinery for an extension of their business.

The Ohio Motor Company, Sandusky, Ohio, are planning to build an addition to their plant.

The Electrical Machinery Company, Minneapolis, Minn., are in the market for an electric traveling crane. They have purchased the old linen mills property at Thirteenth avenue and Polk street, into which they will move their business as soon as the new quarters can be gotten in shape.

Boilers, Engines and Accessories.

The Amet Engine Company of Waukegan, Ill., have been incorporated with a capital stock of $10,000. The incorporators are E. H. Amet and H. M. Legnard of Waukegan and J. A. Adams of Chicago. The engine is stated to be of new design, embodying a new principle in the generation of power. The invention is the discovery of Mr. Amet. It is possible that the factory may be built at Chicago instead of Waukegan.

Joseph T. Ryerson & Son, 18 to 22 Milwaukee avenue, Chicago, have enjoyed an exceedingly satisfactory trade for the past 30 days in the department of heavy boiler and tank shop equipment. The orders received include about a dozen Lennox rotary and bevel shears, three R. D. Wood & Co.'s hydraulic riveters, three heavy Hilles & Jones bending rolls, and a good num-

ber of forging presses, flanging presses, air compressors, hoists, &c. Among the shops for whose equipment these purchases have been made are the following: Standard Oil Company, American Steel & Foundry Company, Granite City, Ill.; Adams Brothers, Findlay, Ohio; Conger Mfg. Company, Groton, N. Y.; Erie City Iron Works, Erie, Pa.: Means & Fulton Iron Works, Birmingham, Ala.; Abendroth & Root Company, New York; Broderick & Quinlan, Montpelier, Ind.; Holthoff Machinery Company, Milwaukee, Wis.; J. F. Thrash, Dallas, Texas; Brownell & Co., Dayton, Ohio; Janowitz & Winters, Lincoln, Neb.; R. Reeves & Co., Toledo, Ohio. The firm have found that the demand for the best equipment of this character is increasing each month. Nearly all of the progressive boiler and tank shops are taking a keen interest in the improvement of their equipment and have accumulated during the past three or four years sufficient resources to warrant a liberal increase in their tools.

The Hollidaysburg Iron & Nail Company, Hollidaysburg, Pa., advise us that they will require at least two large engines, with boilers and accessories, which they will be ready to purchase as soon as the specifications are completed. They are to make extensive additions to their plant.

The American Locomotive Company have received an order for ten new engines, which will be built at their Pittsburgh works, in Allegheny, Pa.

The plant of the J. C. McNeil Boiler Company, Akron, Ohio, which has been in the hands of a receiver for some time, will be sold at master commissioners' sale, February 20, in that city. Stockholders secured an extension some time ago, but were unable to reorganize the company.

The City of Lemoore, Cal., is receiving bids for the construction and installation of a combined electric light and water plant, to cost about $22,000. W. F. Holser, city clerk.

The Central Heat & Power Company have received a 50-year franchise to operate a steam heat and electric power and lighting system in Canton, Ohio. They will erect a large plant for the purpose.

The Aultman & Taylor Company of Mansfield, Ohio, have purchased the plant of the Mansfield Machine Works and have placed the same in operation in the manufacture of small boilers, threshing engines, saw mills, &c. Considerable new machinery has been installed in the plant.

Bids will be received to January 31 by George Killen, village clerk at Columbus Grove, Ohio, on equipment for water works plant. Plans prepared by G. L. McKibben, M.E., Van Wert, Ohio, call for one 1,000,000-gallon pumping engine, one 80 horsepower boiler, hydrants, valves, &c.

Owing to large increase in demand in the Pittsburgh district for the Wickes vertical water tube boiler, it has been found necessary to increase the force, and George F. Lemon, formerly with the Chicago office of Wickes Brothers, has been transferred to Pittsburgh, to take charge of the new boiler department. The capacity of the boiler works of Wickes Brothers at Saginaw, Mich., has been more than doubled in the past year, and the firm are now prepared to offer boilers for reasonably prompt shipment.

The New Martinsville Electric Light, Heat & Power Company are erecting a plant at New Martinsville, W. Va., which will contain two 200 horse-power boilers, two engines, two 100-kw. alternators, transformers, &c. Frank B. Hill is president.

The Crested Butte Light & Water Company, Crested Butte, Col., will increase the plant about 40 or 50 horse-power this summer, either by laying a large pipe line from reserve, or by putting in a steam plant. It is probable that a 1000-light General Electric dynamo, slow speed, will be installed.

The Marine Boiler Works Company, Toledo, Ohio, have completed their organization by the election of the following officers and directors: C. Leeker, president; R. Reeves, vice-president and general manager; C. B. Lloyd, secretary; D. C. Shaw and P. Hassenzhal.

Foundries.

The Keystone Foundry Company, Uniontown, Pa., manufacturers of iron and brass castings and machine work, are thinking of putting up a new foundry and machine shop in the fall, but as yet a definite decision has not been reached.

The Youngstown Steel Casting Company, organized at Youngstown, Ohio, with a capital of $100,000, will build a plant in Youngstown for the manufacture of steel castings. W. R. Palmer has been elected general manager.

The Ellington Mfg. Company, Quincy, Ill., have just completed one of the largest and finest malleable and gray iron foundries in the West. It will have a daily capacity of 50 tons of gray iron castings and 20 tons of air furnace malleable iron castings.

The R. M. Eddy Foundry Company, Chicago, have purchased additional ground adjoining their works on Ohio street for the purpose of extending their manufacturing operations.

The Paris Mfg. & Implement Company, Paris, Tenn., successors to the Paris Machine Shops, will enlarge their plant by the erection of a foundry and implement building.

The controlling interest in the stock of the Lorain Foundry Company, Lorain, Ohio, has been purchased by outside parties whose names are not announced. The management will continue practically as heretofore.

Bridges and Buildings.

J. R. Vaughan, secretary General Committee, Waterloo, Iowa, advises us that plans are completed for a 520-foot bridge on Bridge street, and will be presented to the Supervisor immediately. After acceptance bids for construction will be asked for. Estimated cost, $50,000.

The Oklahoma Bridge & Steel Structural Company have decided to locate a plant at Enid, Okla., and will shortly erect the necessary buildings to conduct manufacturing operations.

Bids will be received up to February 14 for a steel truss bridge over the St. Mary's River, at Wapakoneta, Ohio. C. A. Orphal, County Auditor, is in charge.

Fires.

The Globe yarn mills of the New England Cotton Yarn Company, at Fall River, Mass., were partly destroyed by fire last week. Loss, $200,000.

The plant of the Michigan Buggy Company, Kalamazoo, Mich., was destroyed by fire January 16. Loss is about $200,000.

The roller mill at Sprague Lake, Wash., owned by the Centennial Milling Company, was destroyed by fire January 18. The loss is estimated at $60,000.

W. A. Dygert's planing mill, at Clayton, N. Y., was destroyed by fire last week. Loss between $15,000 and $20,000.

The paper mill of the California Paper & Board Company, at Corralitos, Cal., was destroyed by fire recently. The loss will reach $30,000.

Fire did $5000 damage to the plant of the Dobbie Foundry & Machine Company, Niagara Falls, N. Y., last week.

William H. Shoemaker's ice manufacturing plant, at Ogontz, Pa., was destroyed by fire January 20. The loss is about $20,000, partly covered by insurance.

Hardware.

Nicholson File Company, Providence, R. I., have decided to remove their Pawtucket, R. I., plant to Anderson, Ind., where the large Arcade branch works are located. It is the company's intention to materially enlarge the Anderson plant, giving employment to a greater number of men.

Imperial Cutlery Works have removed from 455 and 457 Fifteenth avenue, Newark, N. J., where they have been for over ten years, to their new location at Avondale, N. J. The company have made several additions to buildings, bought new and larger engine and boilers, and with materially improved and enlarged facilities will by February 1 be able to take care of their patrons more promptly and satisfactorily than in the past.

The Superior Horse Nail Works will be removed from Kankakee to Hoopeston, Ill. A building at the latter place will be remodeled for the purpose of fitting it for the manufacture of horse nails. W. W. Todd will be manager of the factory.

The Atlantic Screw Works, Hartford, Conn., have completed plans for a new factory. It will be of brick, two stories, 50 x 200 feet.

F. E. Myers & Bro., Ashland, Ohio, manufacturers of the Myers pumps and hay tools, have just completed the erection of a large raw material storehouse. It is a three-story brick building, 50 x 160 feet, of modern architecture. They are also increasing the capacity of their power plant by placing in it a 400 horse-power automatic high speed engine, a battery of Wilcox & Babcock boilers, two extra large dynamos and additional motors. These additions will make their power, light and storage capacity nearly one-third greater than heretofore.

Western Cartridge Company, East Alton, Ill., on ground recently purchased, are building a plant for the manufacture of metallic cartridges, a new department. Two buildings will be erected and the force of employees materially increased.

The New York Saw Works, Joshua Oldham & Sons, Twenty-sixth street, Brooklyn, recently destroyed by fire, will be rebuilt at once. No expense will be spared to make the new plant come up to modern standards, in the installation of the best types of machine tools and of high grade engines, boilers, &c. The company are operating an independent plant in the vicinity, and will be ready to deliver saws by February 1. The engineering features of the new plant are being handled by B. Franklin Hart, Jr., M.E., of the office of Edwin Burhorn, 62 Wall street, New York.

The Hard Steel Wire Fence Company of Cuyahoga Falls, Ohio, capital $10,000, have been incorporated by R. R. Littlefield, and Charles F. Shaw of Cleveland, C. E. Wise, George Reid and D. N. Williams of Cuyahoga Falls. The company have secured a location and will have the plant ready for operation within 30 days. Wire fence will be manufactured exclusively. R. R. Littlefield will be general manager.

The stockholders of the Geneva Shears Company, Geneva, N. Y., met on the 14th inst. and voted to dissolve the present company and reorganize with increased capital stock. At the meeting $25,000 capital stock was represented. The increase of stock will be $14,000, and most of this will be taken up by the present holders. In addition to the manufacture of shears the company are also expecting to make razors, and the working force will be increased.

The Columbia Mfg. Company, with a capital stock of $50,000, will resume the business at Antigo, Wis., discontinued four years ago by the Antigo Screen Door Mfg. Company. G. W. Jones, president of the G. W. Jones Lumber Company of Appleton,

Wis., is to be president of the new company; W. L. Elliott, owner of the Antigo electric light plant, will be secretary and treasurer, and D. S. Stewart, owner of a bicycle wood rim manufacturing plant at Aniwa, will be general manager.

The Lodi Steel Box Mfg. Company, Lodi, Ohio, have been organized with a capital stock of $25,000.

Kitselman Brothers, wire fence manufacturers, Muncie, Ind., have acquired an interest in the Parish & Williams wire fence factory at Richmond and in the future the Muncie firm will furnish the wire for the Richmond factory from their steel and wire factory. A number of needed improvements will be made in the Richmond plant.

John N. and William B. Cook have leased the machine shop east of the railroad station formerly occupied by C. M. Broderick, Windsor, Conn., and will manufacture the Star meat cutter and a number of novelties, under the name of Cook Brothers. They will employ from 12 to 14 men at the beginning.

The Millersburg Fifth Wheel Company, Millersburg, Pa., who were established in 1887, were incorporated under the State laws of Pennsylvania May 6, 1901. They manufacture fifth wheels exclusively and of all kinds, including Cincinnati, Derby and Brewster. Their specialty is heavy clipped and plain platform full circle fifth wheels. They have recently added a considerable amount of improved machinery, manufactured specially for them. Business at the present time is very satisfactory, the season opening with good prospects. The officers of the company are C. F. Sponsler, president; F. W. Sponsler, secretary and treasurer, and E. R. Thornton, superintendent.

The Northumberland Iron & Nail Works, Northumberland, Pa., during the latter six months of 1901 were unable to fill orders on time, but now pressure has somewhat slackened, so that they can ship promptly.

The Charles A. Gee Mfg. Company, Cuba, N. Y., formed for the manufacture of the Gee minnow trap, are nearly ready to begin operations.

National Window Screen Company, Hagerstown, Md., will shortly begin the erection of a factory building and power house, the former to be 70 x 125 feet and the latter 20 x 30 feet.

The Monarch Mfg. Company, East Toledo, Ohio, have just completed a brick building 110 x 40 feet, two stories high, with basement. The building adjoins the Craig oil refinery at Ironville. The main plant and office of the Monarch Mfg. Company are located at Council Bluffs, Iowa. The company manufacture axle greases. For some time the Western firm have been getting their raw material from the Craig refinery, and in view of this fact decided that it would be much cheaper to locate a plant at Toledo. Heretofore Eastern trade in the greases has not been especially pushed. It will now be the aim of the firm to establish a good Eastern trade, which will be supplied by the plant at Toledo. Besides a full line of axle greases, the company will also manufacture machine and cup greases and lubricating oils. Their output will be a carload of greases a day.

Bailey Cutlery Company, Brantford, Ont., manufacturers of shears, scissors, razors, knives, &c., have a new and large factory in course of construction, to enable them to meet the increased demand for their products.

Miscellaneous.

F. E. Allen, E. J. Spencer and D. R. Francis of the Laclede Building, St. Louis, Mo., will build an electric road from that city to Alton, Ill., connecting the lines of the Venice & Granite City Street Railway Company and the Alton Railway, Gas & Electric Company. The latter company will extend their line from Alton to East Alton, taking in the new smelter of the Federal Lead Company.

The Ironsides Company of Columbus, Ohio, report such a rapidly developing business as to have necessitated extensive improvements at their factory, just recently completed, which doubles its capacity. Specialties for operating departments for preserving fiber ropes, belting, gearing, wire ropes and metallic surfaces generally, constitute its manufactures.

The Prest Furnace Company, Kansas City, Mo., recently organized, have purchased the plant of the Prest Heading Company, and will manufacture tubular and corrugated furnaces.

The Prentiss Roller & Supply Company, Indianapolis, Ind., recently organized, have purchased the plant of the Elsie Roller Company, which they will equip with modern machinery. To the line of rollers they will add a complete line of printers' supplies.

John Ashcroft of El Paso, Texas, and others, have under consideration the erection of a copper wire mill in that city.

The International Creosoting & Construction Company, Galveston, Texas, have been reorganized and the capital increased to $300,000. The company propose to build new works, double the capacity of the present plant.

The Mitchell & Lewis Company, Limited, of Racine, Wis., will build as an addition to their wagon manufacturing plant a four-story brick building, 120 x 545 feet, and one of the same hight, 120 x 384 feet. The estimated cost of the improvement is $100,000. The already large capacity will be greatly increased by the erection of these buildings. Plans have already been prepared and the construction work will begin as soon as the weather permits.

Blonder Bros. will erect a factory for the manufacture of iron bedsteads on West Superior, near Green, street, Chicago.

J. J. Ryan & Co., brass founders and finishers, 68-74 West Monroe street, Chicago, report receiving contracts for the brass nickel plated trimmings for the marble closet and urinal stalls and lavatories for the following buildings: Pasavant Hospital, Mercy Hospital, Wesley Hospital, Rush Medical College, Manufacturers' Building, National Life Building, Chicago Commons, Chicago; Grand Opera House, Cincinnati; McLean County Court House, Bloomington, Ill.; Montana State Capitol, Helena, Mont.; U. S. Post Office, Streator, Ill.; U. S. Post Office, Monmouth, Ill.; U. S. Post Office, Elgin, Ill.; Draper Building, Honolulu, H. I.

The Forsyth Pattern Works of Youngstown, Ohio, have purchased a site and will erect a large three-story factory for the production of patterns.

The Taylor-Boggis Foundry Company, Cleveland, have purchased a large building adjoining their foundry, which will be used as a warehouse.

The La Belle Iron Works, who are building a large plant near Steubenville, have organized a land company and will establish a suburban town with 1500 homes for employees.

The Tucker Mfg. Company of Newark, Ohio, have incorporated with $50,000 capital stock to manufacture block and galvanized steel sheets into various products. John Tucker, O. M. Tucker, J. R. Tucker, Charles Kibler and Edward Kibler were incorporators.

The directors of the American Frog & Switch Company, Hamilton, Ohio, have decided to double the capacity of their plant at once. The annual meeting held a few days ago showed that the company are enjoying phenomenal growth.

Grant & Williams, steam shovels, rails and equipment, hoisting engines, &c., New York City, are about completing the tearing down of the large iron self supporting derrick that was set up on the steamboat docks at Fall River, Mass., about 40 years ago, and which has been a conspicuous landmark in that vicinity for a number of years. It was built especially for the handling of heavy material for steamboat construction, and had a capacity of lifting 100 tons.

Director Immel of the Columbus, Ohio, Water Works Department, is corresponding with manufacturers with a view to securing figures on 10,000 water meters for use in the city water supply.

The Commercial Club of Joplin, Mo., are perfecting details for the reorganization of the Pitless Scale Company, of Pleasant Hill, with increased capital and the removal of the plant to the former place. No site for the new plant has been selected as yet, but the company have several in view.

The New Process Raw Hide Company, Syracuse, N. Y., received an order from the British Westinghouse Electric & Mfg. Company for 60 of their New Process noiseless pinions for the equipment of the British Company's new plant. These pinions are to be used on motors for driving machine tools, electric cranes, &c., and are for transmitting from 5 to 40 horse-power. The Company report business as very good at the opening of the new year. Orders from other sources are coming in fast, and the outlook is promising for a good business year.

A New Town Near Pittsburgh.—The East Pittsburgh Improvement Company, composed of George Westinghouse and others, are laying out a new town at Stewarts Station, on the Pennsylvania Railroad, about 18 miles from Pittsburgh. It is to be known as Trafford City. The company own 650 acres of land at this place, 100 of which will be reserved for the building of a very large foundry, which will make castings required for the various Westinghouse plants at Wilmerding, East Pittsburgh, Pittsburgh and elsewhere. The contract for the erection of the foundry has been let to a Chicago concern and work on it is well under way. It is the intention to grade, pave and sewer all the streets in the new town, and natural gas, artificial gas and electric light will also be furnished. The company will also build about 100 new houses, to be occupied as homes by Westinghouse employees.

At Pittsburgh, in the patent infringement case of H. Adler against the Adams & Donaldson Mfg. Company and Demmler Bros., a preliminary injunction was refused. A gas stove is involved. The court said that the questions involved should not be determined at this preliminary stage, and that it is the usual practice for motions for preliminary injunctions in cases in which the patent had not been sustained to go to a final hearing. The suit now goes on the regular trial list.

The Iron and Metal Trades.

From all the affected districts come reports of a further improvement in the Coke situation and in the handling of freight. The Coal operators generally throughout the country are complaining of a scarcity of skilled miners.

Ore prices have not yet been finally established, although an announcement is looked forward to soon.

In the Pig Iron trade interest now centers in the third and fourth quarters of the year. In some sections and in some departments of the trade buying is reported on quite a liberal scale, but it looks as though the majority of consumers are now disposed to await further developments, being covered pretty far ahead. For spot Iron all sorts of prices are being paid. Chicago reports some heavy sales for the third quarter, and it appears that so far as the Foundry Iron market is concerned the situation there is peculiar, since the demands for Steel manufacture will limit sharply the tonnage produced by a leading interest for Foundry and Malleable Iron.

In the East some very high prices, up to $16,50, have been paid for spot Basic Pig, and some large transactions have taken place for the second half at $15.75. In the Central West there has been a moderate amount of business done in Bessemer Pig, with a premium paid for prompt delivery.

In the Billet trade we note some further sales of foreign Steel, in moderate lots, for delivery both in Eastern and Western Pennsylvania. It is noticeable that Canadian Steel is now being offered.

It appears that the Steel Rail mills now have on their books for 1902 delivery about 2,350,000 tons, which is pretty near the full capacity. Under the circumstances it is not surprising that the Mexican Central order for about 35,000 to 40,000 tons has gone abroad. Reports have it that a large order has been placed by an American road with foreign makers, for Gulf delivery. The Pacific Coast will probably be forced to depend this year to a considerable extent upon imported Rails. Some small orders have already been placed, and larger quantities seem likely to follow.

The demand for Structural Material is very heavy and, as our local reports show, a good deal of new business is being placed, with plenty of it in sight. It is reported that in December the leading interest, the American Bridge Company, booked orders aggregating close to 50,000 tons, and that at the rate at which contracts have been entered this month that tonnage will be duplicated. The company have now on hand orders for about 400,000 tons, equivalent to eight months' output.

Such data throw a full light on what is, after all, the most vital question, and that is whether the tremendous consumption of this country is likely to go on unabated during all of this year, the first six months being settled.

Somewhat conflicting accounts are being received as to the Plate trade. The capacity has been so much increased of late that even the great shipbuilding, bridge building, car, locomotive and boiler ship orders do not seem to afford certainty beyond two or three months. In the Sheet and Merchant Pipe trades employment is fair, but the outside mills are making an impression. The Skelp trade is light.

On Bars the reports from the West are very encouraging.

In the Wire trade prices are again firmer, as the result of the conferences held. A further meeting is to take place at an early date.

Copper is still weak, although apparently the European buyers have been taking hold lately. Domestic consumers continue to act very cautiously.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type Declines in Italics.

	Jan. 22, 1902.	Jan. 15, 1902.	Dec. 25, 1901.	Jan. 23, 1901.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	**$16.75**	$16.75	$15.75	$15.50
Foundry Pig No. 2, Southern, Cincinnati	**$14.75**	14.75	14.25	13.75
Foundry Pig No. 2, Local, Chicago	**16.50**	16.00	15.50	15.00
Bessemer Pig, Pittsburgh	**16.75**	16.50	16.50	13.25
Gray Forge, Pittsburgh	**16.25**	16.25	15.25	13.25
Lake Superior Charcoal, Chicago.	**19.50**	19.50	18.50	19.50
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	**27.50**	27.50	27.00	19.75
Steel Billets, Philadelphia	29.50	....	29.50	21.00
Steel Billets, Chicago	....	....	....	20.75
Wire Rode, Pittsburgh	**34.00**	33.50	34.25	....
Steel Rails, Heavy Eastern Mill.	28.00	28.00	28.00	26.00
Spikes, Tidewater	2.00	2.00	2.00	1.50
Splice Bars, Tidewater	1.65	1.65	1.65	1.35
OLD MATERIAL:				
O. Steel Rails, Chicago	**14.75**	14.75	14.00	11.00
O. Stel Rails, Philadelphia	**18.50**	18.25	18.00	16.00
O. Iron Rails, Chicago	21.00	21.00	21.00	17.50
O. Iron Rails, Philadelphia	*21.00*	21.50	21.50	18.00
O. Car Wheels, Chicago	**16.50**	16.00	16.00	15.50
O. Car Wheels, Philadelphia	**17.00**	17.00	16.75	17.00
Heavy Steel Scrap, Chicago	**13.75**	13.50	13.50	11.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia.	1.67	....	1.65	1,.45
Common Iron Bars, Chicago	1.65	1.65	1.65	1.45
Common Iron Bars, Youngstown	1.50	1.50	1.50	1.30
Steel Bars, Tidewater	1.67	....	1.70	1.40
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.25
Tank Plates, Tidewater	1.78	1.78	1.75	1.55
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.40
Beams, Tidewater	1.75	1.75	1.75	1.65
Beams, Pittsburgh	1.60	1.60	1.60	1.50
Angles, Tidewater	1.75	1.75	1.75	1.55
Angles, Pittsburgh	1.60	1.60	1.60	1.40
Skelp, Grooved Iron, Pittsburgh.	*1.70*	1.70	1.75	1.50
Skelp, Sheared Iron, Pittsburgh.	*1.75*	1.75	1.80	1.55
Sheets, No. 27, Pittsburgh	2.90	2.90	2.90	2.85
Barb Wire, f.o.b. Pittsburgh	2.90	2.90	2.90	2.80
Wire Nails, f.o.b. Pittsburgh	2.00	2.00	1.95	2.20
Cut Nails, Mill	2.05	2.05	2.05	1.95
METALS:				
Copper, New York	*11.00*	11.00	12.00	17.00
Spelter, St. Louis	*4.10*	4.12½	4.15	3.95
Lead, New York	4.00	4.00	4.00	4.37½
Lead, St. Louis	*3.90*	3.90	3.95	4.20
Tin, New York	**23.62½**	23.75	23.30	26.75
Antimony, Hallett, New York.	*8.00*	8.00	8.25	9.25
Nickel, New York	*50.00*	50.00	60.00	55.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	4.19	4.19	4.19	4.19

Chicago.

FISHER BUILDING, January 22, 1902.—(*By Telegraph.*)

No indication is yet visible of any tendency to weakness in this market. The Pig Iron situation is especially strong, while the demand keeps up surprisingly for finished products generally. The advance on Wire products, while not large, was sufficient to impart much more activity to this branch of the trade, which carries with it a very good movement in Hardware. Structural Steel mills are sold so far ahead that some of the largest manufacturers have withdrawn from the market and will take no orders on Shapes, except those of largest sizes, for which the demand is not so heavy. Consumers of Steel Billets are having serious trouble, finding the supply very short.

Pig Iron.—Large transactions are reported for delivery in the third quarter of the year. The heaviest purchase is believed to have been made by a Car Wheel company to cover business recently booked by them. They bought about 10,000 tons. Quite a number of contracts have been placed for lots of 3000 to 5000 tons, the buyers being manufacturers of agricultural implements, radiators, stoves and general castings. Negotiations are in hand for further large quantities, showing that the buying movement has not yet ended. A sharp demand exists for spot lots of Iron, on which good pre-

miums are freely paid above prices ruling on contracts. The supply of Iron for quick shipment is very small, as such Iron can now only be obtained from a few Southern or Lake Superior Charcoal furnaces. Gray Forge is exceedingly scarce, large buyers reporting that they can find none offered for delivery prior to July, even by the leading Southern companies. The situation has improved with respect to the Coke supply, and nearly all the furnaces in this locality recently banked are again in operation. They have so far contributed no relief to the Foundry Pig Iron trade, as their stock of Bessemer Iron has run low at the local Steel works, and the furnaces recently started up are making Bessemer Iron. Lake Superior Charcoal is still in active demand for malleable purposes. We quote as follows:

Lake Superior Charcoal	$19.50 to $20.50
Local Coke Foundry, No. 1	16.50 to 17.00
Local Coke Foundry, No. 2	16.00 to 16.50
Local Coke Foundry, No. 3	15.50 to 16.00
Local Scotch, No. 1	16.50 to 17.00
Ohio Strong Softeners, No. 1	19.50 to 20.00
Southern Silvery, according to Silicon.	16.90 to 17.15
Southern Coke, No. 1	16.40 to 16.65
Southern Coke, No. 2	15.65 to 15.90
Southern Coke, No. 3	15.15 to 15.40
Southern Coke, No. 1 Soft	16.40 to 16.65
Southern Coke, No. 2 Soft	15.65 to 15.90
Foundry Forge	14.65 to 14.90
Southern Gray Forge	14.65 to 14.90
Southern Mottled	14.15 to 14.65
Southern Charcoal Softeners, according to Silicon	15.50 to 16.50
Tennessee Silicon Pig	17.15 to 17.65
Alabama and Georgia Car Wheel	20.65 to 21.65
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	18.25 to 20.00
Jackson County and Kentucky Silvery, 8 per cent. Silicon	18.50 to 19.00

Bars.—The volume of business now being done would be large any part of the year, but coming in midwinter it surprises the entire trade. Consumers particularly cannot understand the situation. Hoping to get concessions, they find mills withdrawing from the market with their product sold for three or four months. All classes of consumers are buying. The car builders are constantly running out of material and placing fresh orders. Wagon makers, implement manufacturers and other large interests are not only ordering for as early delivery as possible, but are freely placing contracts running over the first half of the year. Some of the largest Bar manufacturers report the past week one of the best they have ever experienced. Steel Bars are so hard to get that sales are easily made above our minimum price. Angles were never so scarce as at present, and readily command 2c., Chicago, for mill shipment. Quotations on Iron and Steel Bars are continued at 1.65c. to 1.80c., and Hoops at 2.10c. to 2.20c. Jobbers report their business keeping up to its past large volume constantly causing trouble by the shortage of standard sizes. Small lots are quoted at 1.90c. to 2c. for Bars, and 2.40c. to 2.50c. for Hoops.

Structural Material.—The mills are so crowded with work and delivery on ordinary sizes of Beams, Channels and Angles is now so far in the future that the largest manufacturers have withdrawn from the market, refusing to name any time for shipments on new business which may be offered. A great deal of fresh inquiry is in hand, some for large buildings in the Rocky Mountain States, as well as towns near by, and others for bridge work, of which a great deal is coming up. A contract has been placed for a new building for the McCormick Harvesting Machine Company to take 14,000 tons, which is only the first of a series of buildings to be put up by the company. Another building to take 1000 tons will probably be placed this week. The demand for small lots of Shapes to be shipped from local yards is so great as to tax their facilities. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.05c.

Plates.—The improvement in demand recently noted seems to have subsided and trade is now only moderate. The local mills continue in operation, but the demand for mill shipments is not heavy. Jobbers report a fair movement from stock, but they could easily handle considerably more business. A misprint in last week's report made the new extra on heads 3-10c. This should have been 2-10c. Mill shipments are quoted as follows: Tank Plate, ¼-inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c. to 1.95c.; Marine, 1.95c. to 2.05c. Jobbers are selling small lots from store at 1.90c. to 2c. for Tank and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

Sheets.—The independent mills are feeling the usual midwinter slackness in the demand for standard sizes. The mills making a full range of sizes and qualities are picking up considerable business, however, so that trade cannot be called dull. It is in fact remarkably good for this time of the year. Mill shipments of No. 27 Black Sheets are now quoted at 3.05c. to 3.15c., Chicago. Jobbers have slightly reduced the store price and small lots of No. 27 Black Sheets are quoted at 3.35c. to 3.45c., and Galvanized at 70 and 2½ to 70 and 5.

Merchant Pipe.—This is the quiet season, and manufacturers do not expect much business. The independent mills are making themselves felt whenever an order of fair size is in the market, but the leading Pipe interest has not yet made any reduction in regular market rates. Carload lots are now quoted as follows, random lengths: Black, ⅛ to ½ inch, 60 off; ¾ to 10 inches, 67 off; Galvanized, ⅛ to ½ inch, 47 off; ¾ to 6 inches, 55 off.

Boiler Tubes.—Quite a good business is reported in this line, prices being well maintained, both by manufacturers and jobbers. Quotations are as follows:

	Steel.	Iron.
2¾ to 5 inches	57½	47½
1¾ to 2½ inches	50	40
1 to 1½ inches	35	30
6 inches and larger	52½	45

Cast Pipe.—Among recent sales are 1500 tons to the city of Chicago. Inquiries are numerous, some of them running into a good tonnage, and it is expected that contracting will shortly begin for the coming season. Sales agents report that the prospects for this year indicate fully as large a business as that of last year, provided that Pig Iron prices do not advance costs to such an extent as to make Pipe dear, which would then have a tendency to discourage expectant buyers. Many municipalities are contemplating improvements in existing systems or the installation of new plants. Water Pipe, Chicago, is quoted as follows: Eight-inch upward, $26 to $27; 6-inch, $26.50 to $28; 4-inch, $27.50 to $29.

Merchant Steel.—The mills making Merchant Steel are not in a position to take business for very early delivery, but find a strong demand for such of their product as they are able to promise within reasonable time. Some contracts are also being placed for future delivery. Mill shipments, Chicago, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.90c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.20c. to 2.35c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 to 60 off in carload lots. Ordinary grades of Crucible Tool Steel are quoted 6½c. to 7c. for mill shipments; specials, 12c. upward.

Rails and Track Supplies.—The demand for Standard Steel Rails is so great that manufacturers report that 50,000 tons more could easily be taken, if deliveries could be promised even as early as August. The inability to promise earlier than October and November has prevented the placing of any fresh orders. Light Rails are in extremely active demand, and the local mills are steadily making sales in excess of their output. Heavy Sections are quoted at $28 and Light Sections at $31 to $35. Fastenings are quoted as follows: Splice Bars, 1.70c. to 1.80c.; Spikes, 2c. to 2.10c.; Track Bolts, with Hexagon Nuts, 2.90c. to 2.95c.; Square Nuts, 2.75c. to 2.80c.

Steel Billets.—Small lots of Open Hearth Forging Billets are now selling at $35. The supply of Billets still continues inadequate to the requirements of the market.

Old Material.—Dealers are enjoying a fair trade, both in material for rolling mill use and Cast Scrap. The firmness of the market for new products is having its effects on Old Material, and prices are gradually seeking a higher level. Dealers are hopeful that a greater advance can be ultimately secured, but the large buyers are using every influence to keep prices down. The following are approximate quotations per gross ton:

Old Iron Rails	$21.00 to $22.00
Old Steel Rails, mixed lengths	14.75 to 15.00
Old Steel Rails, long lengths	20.50 to 21.00
Heavy Relaying Rails	25.50 to 26.50
Old Car Wheels	16.50 to 17.00
Heavy Melting Steel Scrap	13.75 to 14.00
Mixed Steel	10.50 to 11.00

The following quotations are per net ton:

Iron Fish Plates	$17.00 to $17.50
Iron Car Axles	21.00 to 22.00
Steel Car Axles	18.00 to 18.50
No. 1 Railroad Wrought	15.50 to 16.00
No. 2 Railroad Wrought	14.00 to 14.50
Shafting	16.00 to 16.50
No. 1 Dealers' Forge	12.50 to 13.00
No. 1 Busheling and Wrought Pipe	11.25 to 11.50
Iron Axle Turnings	12.25 to 12.50
Soft Steel Axle Turnings	10.50 to 11.00
Machine Shop Turnings	10.50 to 11.00
Cast Borings	5.50 to 5.75
Mixed Borings, &c	5.50 to 5.75
No. 1 Boilers, cut	11.00 to 11.50
No. 2 Boilers, cut	10.00 to 10.50
Heavy Cast Scrap	12.00 to 12.50
Stove Plate and Light Cast Scrap	9.00 to 9.50
Railroad Malleable	12.50 to 13.00
Agricultural Malleable	11.50 to 12.00

Metals.—A better demand is reported for Copper, as buyers are now inclined to think that prices cannot go much lower. Carload lots of Lake are selling at 11½c., and Casting brands at 11¼c. Pig Lead is in fair request at 3.95c. for Desilverized and 4.05c. for Corroding in 50-ton lots. Old Copper and Brass are very active, as the prices now prevailing are attractive to consumers. Selling prices on small lots about 10½c. for Heavy Cut Copper, and 9c. for Copper Bottoms. Small lots of Pipe Lead are selling at 3.75c., and Zinc at 3c.

Coke.—The supply has improved to such an extent that the Coke famine may be said to have practically ended. Connellsville Coke is scarce, but shipments from other sections are coming in more freely. Spot Coke within the past week has brought $5.50 to $6, but it is expected that lower prices will soon prevail. Contracts for future delivery are being made at $5.25 for strictly 72-hour Connellsville Foundry Coke.

The American Malleable Casting Company, Chamber of Commerce Building, Chicago, whose works are at Chicago Highlands, Ill., have reorganized, and will hereafter be known as the American Malleable Iron Company. John H. Palmer is president and Burton Smith is secretary and treasurer of the new company. The capitalization is $200,000. The works of this company are of large size, having an annual capacity of 20,000 tons.

Philadelphia.

FORREST BUILDING, January 21, 1902.

There is not much new light on the Iron and Steel situation. The same general conditions prevail, with a continued upward tendency in the prices of Pig Iron and marked firmness in all finished products. The volume of business is maintained at its fullest limit, and, as far as can be seen, it is likely to increase rather than diminish. The scarcity of Pig Iron for January and February shipments shows no abatement, although it is said that the Coke and transportation situation is improving, but in this district complaints are as great and as frequent as they have ever been. Buying of Pig Iron for the last half of the year has been rather a conspicuous feature during the past few days, and furnaces are in a condition to be perfectly indifferent as regards new business for a long time to come, and the same remark would apply to the majority of other important interests. From the above statement it would therefore appear that the trade situation is one of unalloyed bliss, and to some extent this is true, but every rose has its thorn, and in this case the thorn is the extreme difficulty in getting deliveries, as well as serious anxiety in regard to prices. At the present time there is absolutely no uniformity, as every transaction stands on its own merits—No. 2 X may be 16.75, $17, or from that up to $18, all depends upon the circumstances in each individual case, which are too numerous and too varied to be specified, although doubtless well understood in the trade. Sellers all want to get as much as the market will afford, but it can be truly said that there is a general feeling that it is not good policy to squeeze for the last cent there is in it, and especially so in view of the somewhat uneasy feeling that appears to be developing in financial circles, which is about the only weak spot on the horizon at the present time.

Pig Iron.—It is difficult to secure good brands of Iron at last week's prices. Once in a while a sale of No. 2 X Foundry is reported at about $16.75, but there are a great many more at $17.25, some at $17.50 and some at a still higher figure, the outside rate being for deliveries during the first quarter of the year and the lower one for the second, third and fourth quarters. Mill Irons are also extremely scarce and all sorts of prices are mentioned, but $16 to $16.50 would be about as well as could be done, although a bid for 1000 tons at $16 at furnace for next month's shipment is said to have been turned down. It should be said, however, that it was not a question of price, but the deliveries could not be made, and this is a matter of almost daily occurrence. How much of this is to be attributed to the car and Coke shortage, and how soon it will be overcome, is a matter which no one appears to be able to answer, hence the nervous and unsettled feeling which pervades the entire market. Of course if normal conditions are restored within a reasonable time prices are expected to be easier, but there is so much uncertainty in regard to these matters, and stocks are so small, that everything is in a turmoil and consumers hardly know what to expect from one day to another. The range of prices would probably be about as follows for Philadelphia and nearby deliveries: No. 1 X Foundry, $18 to $18.50; No. 2 X Foundry, $17 to $17.75; No. 2 Plain, $16.50 to $16.75; Standard Gray Forge, $16 to $16.25; Ordinary Gray Forge, $15.25 to $15.75; Basic (Chilled), $16 to $16.50; Bessemer, $19 to $19.50.

Billets.—Sales of several thousand tons have been made at about $30, delivered, and one or two small lots at a trifle better than that. The fact that German Billets are being delivered in the Pittsburgh district at $27.50 is a most curious feature, when buyers on the seaboard have to pay $30 for what is supposed to be similar qualities.

Plates.—Orders are coming in very freely, and it is about all the mills can do to handle them properly. Bridge work leads in point of activity, but locomotive boiler and tank work is taking an immense tonnage, and for the present there are no signs of abatement. Shipbuilding is active, but not much new work is coming in at the moment. Prices steady, and for Philadelphia and nearby deliveries are as follows: Universals, 1.75c. to 1.80c.; Sheared, 1.75c. to 1.80c.; Flange, 1.85c. to 1.95c.; Fire Box, 1.95c. to 2.05c.; Marine, 1.95c. to 2.05c.; C. H. No. 1 Iron, 2.40c.; C. H. No. 2 Flange, 2.90c.; C. H. No. 1 Flange Fire Box, 3.40c.

Structural Material.—Continued activity prevails in this department, and orders appear to be constantly growing larger. One of the leading concerns report that there is more business in prospect than at any time on record. Locally, there are inquiries for material for the new structure to be erected at Broad and Chestnut streets, also for one at Fifteenth and Chestnut, probably about 10,000 tons all told. Besides that there are numerous smaller orders, which is causing unprecedented activity in this line of business. Nominal quotations are as follows for seaboard or nearby deliveries: Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.

Bars.—There is not much change in the Bar situation. Consumption is large, and is giving a great deal of work to the mills, but deliveries are easier, and there is no difficulty in securing prompt attention. Most of the mills are said to be full of work, but in some localities they are not as well employed as in others, which, however, may be partly due to the fact that some adjoining mills which are not in the association are selling below the pool prices. Prices are about as follows: Iron Bars, 1.67c. to 1.72c., delivered; Steel, 1.62c. to 1.67c.

Sheets.—More demand than can be supplied, owing to the impossibility of getting in material to run full time; mills badly handicapped on this account. Prices about

as follows for deliveries during January and February in carload lots: No. 10, 2.40c. to 2.50c.; No. 14, 2.60c.; Nos. 16 and 17, 3c.; Nos. 18-21, 3.10c.; Nos. 26, 27, 3.30c. to 3.40c.; No. 28, 3.50c.

Old Material.—There is quite a scarcity of Steel Scrap as well as some grades of mill scrap, and prices are therefore somewhat higher than they were a week ago. Bids and offers are about as follows for deliveries in buyers' yards: Low Phosphorus Scrap, $22 to $24; Choice Railroad Scrap, $20 to $21; Light (Ordinary), $13 to $14; Light (Forge), $15 to $16; Machinery Cast, $14.75 to $15.25; Heavy Steel, $18.50 to $19; Old Steel Rails (short lengths), $18.50 to $19; Old Iron Rails, $21 to $22; Wrought Turnings, $13 to $13.50; Choice Heavy, $14 to $15; Cast Borings, $8 to $8.50; Old Car Wheels, $17 to $17.50; Iron Axles, $24.50 to $25.50.

Cincinnati.

FIFTH AND MAIN STS., January 22, 1902.—(*By Telegraph.*)

There has been so little change in the Pig Iron situation during the past week that simple reference to the report of a week ago with the legend, "them's my sentiments," would almost suffice. The fact is pretty well recognized now that all the Iron which can be safely counted for delivery up to July is booked on contracts. There has been quite a considerable amount of selling for the last half, but there is at this time a growing disposition on the part of buyers to go rather slow in contracting for the last half of the year. The amount of business done in the territory immediately tributary to this place during the past week was rather small, but that does not excite any surprise nor anxiety on the part of furnace representatives. While here and there an occasional furnace is asking 25c. above the quotations given herewith, it is generally recognized that there is but one price for Iron in this territory. If there was any Iron for immediate delivery it would, of course, command a premium. The situation is strong and healthy, and the only trouble is the car situation, which, while being somewhat easier than it was a month ago, is at this time offering but little promise of any real betterment within the next few months. Freight rate from the Hanging Rock district is $1.10 and from Birmingham $2.75. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	.... to $15.25
Southern Coke, No. 2	.... to 14.75
Southern Coke, No. 3	.... to 14.25
Southern Coke, No. 4	.... to 13.75
Southern Coke, No. 1 Soft	.... to 15.25
Southern Coke, No. 2 Soft	.... to 14.75
Southern Coke, Gray Forge	.... to 13.75
Southern Coke, Mottled	.... to 13.75
Ohio Silvery, No. 1	$16.25 to 16.75
Ohio Silvery, No. 2	15.75 to 16.25
Lake Superior Coke, No. 1	.... to 17.10
Lake Superior Coke, No. 2	.... to 16.60
Lake Superior Coke, No. 3	.... to 16.10
Southern Basic	.... to 14.75

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades	$18.75 to $19.25
Standard Southern Car Wheel, No. 2	17.75 to 18.25
Lake Superior Car Wheel and Malleable	18.50 to 19.00

Plates and Bars.—There is no change to report in this market. Prices are strong and unchanged. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.65c. to 1.70c., with half extras; same in small lots, 1.80c. to 1.90c., with full extras; Steel Bars, same price as Iron Bars, base; Angles, in carload lots, 2c.; Plates, ¼-inch and heavier, 1.90c. to 2c.; 3-16-inch, 2.10c.; Sheets, No. 16, 2.90c. to 3c.

Old Material.—The market has been quiet throughout the past week on an unchanged basis, and there is an element of steadiness which gives promise of but little immediate change in the selling prices. We quote dealers' buying prices, f.o.b. Cincinnati: No. 1 Wrought Railroad Scrap, per net ton, $15.25 to $15.50; Cast Railroad and Machine Scrap, $12.25 to $12.75; Iron Axles, $20.50 to $21; Iron Rails, $19.50 to $20; Steel Rails, rolling mill lengths, $15.75 to $16; short lengths, $13.75 to $14; Car Wheels, $16 to $17. All prices except No. 1 Wrought on the basis of gross tons.

Cleveland.

CLEVELAND, OHIO, January 21, 1902.

Iron Ore.—The Ore producing companies have made their estimate of the amount they expect to produce during the year, and have made all other arrangements for the year's business with the possible exception of fixing the prices at which the Ore is to be sold. It is expected that the estimates will be gone over at a meeting here the latter part of this week or the first of next and some decision arrived at as to the price of Iron Ore. Some of the estimates are very large, and it may be necessary for some of them to be scaled down, that the plan to fix higher prices on non-Bessemer Old Range Ore and Bessemer and non-Bessemer Mesaba Ores may not be embarrassed. The Ore men, it is understood, are intending to try to produce during the year 25,000,000 tons of Ore and send it down the lakes. The present estimates, however, will approach nearer to 27,000,000 tons, according to the statement of some. All of the mining properties are preparing to install faster machinery and to produce in larger quantities. The lake shipment, however, regardless of the action of the producing concerns, either now or later on, will be restricted to a certain extent by the lack of facilities at the receiving ports for handling the Ore from the holds of vessels to the stock piles of the furnaces. The shippers are not neglecting to make allowance for this feature of the situation, and it is altogether possible that it will be responsible for a large scaling in the amounts it is proposed to ship, even more, in fact, than the price consideration would demand. Regarding the prices, it is now said that the proposition is to make a horizontal increase of 50c. a ton, excluding only the Bessemer Old Range Ores, which are bringing high enough prices now.

Pig Iron.—The producers of Pig Iron have been freed, in a very large measure, from the grasp of the car shortage during the last ten days. Practically all of the furnaces in the Valley have now been blown in, and production is going ahead at a very rapid rate. The only difficulty which is now presenting itself is that of making deliveries of the material which has been produced. The car supply is almost entirely adequate to the shipment of all the Coke that is demanded, yet the furnaces either do not produce the Iron fast enough or the railroads cannot forward it with sufficient dispatch to satisfy the consumers, for there are many complaints. The relief from the car shortage came more from an increase in motive power than anything else and therefore may be considered a permanent feature, rather than a relief contingent upon the failing demand in the other trades for cars. The producers of Foundry Iron report that material for immediate shipment is exceedingly scarce. Some of them are not offering to sell any Iron, even in carload or 100-ton lots, much before four or five months, and other furnaces report that unless there is a sudden and unexpected increase in production, they will have nothing to sell for the remainder of the first half of the year. This does not relieve the demand, however, as some consumers are hard pushed for material which they need immediately. The prices remain firm, at $16.50 and $16, respectively, in the Valley, for Nos. 1 and 2.

Finished Material.—The demand for Structural Material this week is the feature in the Finished Material trade. The buying in anticipation of the spring trade has been going on for several months, but has now come to an acute stage. It has actually reached the point where some of the producers are forced to say that they can make no deliveries within three or four months, and with many of them four months is the inside limit. Notwithstanding this fact there is an incessant demand for Structural Steel and the market is looking up. Cleveland is in the midst of a building boom, which this condition of the market indicates. Plans have been made for the erection here during the year of practically a duplication of all of the larger buildings in the city, which will entail an outlay of many millions of dollars. Other building projects call for mammoth quantities of Steel. The price holds firm

at 1.70c. The Plate trade is also looking up. A short time ago the mills were looking about for tonnage. Now they are in a comfortable condition. There is no such demand for Plates as for Structural Steel, but the business is in a very satisfactory condition and the market has taken on new strength in the last few days. The price holds firm at 1.70c. Bars are in better demand than they have been and orders are now coming in considerably in excess of production. In addition the inquiries for material are so heavy as to indicate an enormous business in prospect. The talk of any advance in price has died away, although the conditions are more conducive now than they were a week ago, since the demand is better. The larger organizations in the pool, however, have issued an ultimatum against an increase, and the rumors of one such vanished. Bar Iron is quoted at 1.50c., Pittsburgh; Bessemer Steel Bars at 1.50c., Pittsburgh, and Open Hearth Steel Bars at 1.60c., Pittsburgh. Sheets are also in good demand and the tonnage is coming in heavier. Stocks in store are being drawn on very heavily and contracts covering future needs are quite large, as was illustrated in several big orders taken during the last few days. In fact, some of the dealers are fighting off orders, not being able to take proper care of them. The quotations out of store remain at from 3.35c. to 3.50c. on No. 27 One Pass Cold Rolled, Full Cold Rolled being quoted at 10c. extra. There is a slight letting up in the demand for Tin Plate, principally because the canning season is over, but this easing of the market is hardly appreciable. Tube and Wire producers are reporting that the market has taken a brace during the week, and now all indications of weakness have entirely disappeared, which is the reverse of conditions noted a couple of weeks ago. Some Rail orders are also showing up, but the producers are inclined to hold them back, since the demand has already been too heavy for the comfort of the producers and there is some fear that the mills will be too greatly oversold. The price remains $28.

Old Iron.—The demand for Scrap this week has been quite heavy and the dealers report that the market is steady at the old prices, which follow: No. 1 Wrought, $16 net; Cast Borings, $8 gross; Wrought Turnings, $12.25 gross; Cast Scrap, $13 net; Stove Plate, $10 net; Heavy Steel, $17 gross; Old Iron Rails, $22 gross; Steel Rails, $17 gross; Old Iron Axles, $22 net; Old Car Wheels, $17 gross.

St. Louis.

CHEMICAL BUILDING, January 22, 1902.—(*By Telegraph*).

Pig Iron.—The general condition as reported in the Pig Iron market is a continuance of the good inquiry and demand which has been ruling at this center for some time. Individual requirements are not on a large scale, one for 1500 tons for delivery the first three months being about the most liberal to be noted. It looks as though the call from the larger local concerns was provided for some time ahead, but the demand from outside sources included in this district is on a good scale. Furnaces are not in a position to comply with quick delivery for any round lots, and it would seem that a more quiet feeling might be looked for with prices holding at present level. We quote as follows for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry	$15.75 to $16.00
Southern, No. 2 Foundry	15.25 to 15.50
Southern, No. 3 Foundry	14.75 to 15.00
Southern, No. 4 Foundry	14.25 to 14.50
No. 1 Soft	15.75 to 16.00
No. 2 Soft	15.25 to 15.50
Gray Forge	14.25 to 14.50

Bars.—The advance in Iron Bars by the mills of $2 a ton announced to-day has greatly stimulated the demand, and orders are said to be on a very heavy scale. Jobbers report a very strong condition of trade, and, although no advance has been announced to meet the new mill prices on Iron Bars, it will undoubtedly be made in due course. We quote from mill: Iron Bars at 1.80c.; Steel Bars at 2c. Jobbers quote Iron Bars at 2c., and Steel Bars at 2.10c., full extras.

Rails and Track Supplies.—The exceptionally heavy demand and inquiry in the Rail department of the market continues, and no new developments are to be noted. The exceedingly heavy demand for Track Supplies continues, with no changes to be noted in the price-list. There is about to be felt a stringency in Spikes, as the mills are said to be called upon to supply beyond their capacity. We quote: Splice Bars, 1.75c. to 1.95c.; Bolts, with Square Nuts, 2.75c. to 2.90c.; with Hexagon Nuts, 2.90c. to 2.95c.; Spikes, 2c. to 2½c.

Angles and Channels.—The market for Small Angles and Channels shares in the generally satisfactory condition of other departments of the market, and prices are on the same basis as last quoted. Jobbers quote at 2.30c., base, for materials of this class.

Sheets.—In the market for Sheets of all grades and sizes activity and generally firm conditions rule. Jobbers quote Stove Pipe size, No. 27, 3.45c. to 3.50c.; Galvanized Sheets, 65 and 10 off, and in round lots 70 to 70 and 5 off.

Pig Lead.—A quieter tendency is reported in the Pig Lead situation, and a smaller volume of business is said to have been transacted in the last week. Missouri brands at 3.90c. to 3.92½c. and Desilverized at 3.95c. are the market figures.

Spelter.—A quotation of 4.12½c. to 4.15c. and a lighter run of transactions cover the conditions at present in the Spelter market.

Pittsburgh.

HAMILTON BUILDING, January 22, 1902.—(*By Telegraph.*)

Pig Iron.—There is very little Pig Iron to be had for shipment this side of July, and very high prices can be obtained by furnaces that can spare any Iron for shipment in the next three or four months. No large lots of Bessemer have recently been sold, but we can note sales of 8000 to 10,000 tons of Standard Bessemer for shipment in February and March at $16.50 at furnace or $17.25, Pittsburgh. In fact, there would be no trouble to sell Bessemer Iron in moderate sized lots for shipment this side of July at $16.50 at furnace. Forge Iron for prompt shipment has sold at $16.50, Pittsburgh, while No. 2 Foundry for second quarter has sold at $16.50 to $16.75, Pittsburgh. We quote Standard Bessemer Iron at $16 to $16.50, at furnace, or $16.75 to $17.25, Pittsburgh. Standard Gray Forge is $16.25 for forward delivery and $16.50 for prompt shipment. No. 2 Foundry is $16.50 to $16.75 and No. 1 $17 to $17.50 depending on delivery. We note a sale of 3000 tons of Bessemer for February, March and April at $16.50, Valley furnace; 500 tons of Gray Forge for prompt shipment at $16.50, Pittsburgh, and 2000 tons No. 2 Foundry for April, May and June at $16.50, Pittsburgh.

Billets.—Prompt Steel seems to be getting scarcer, and sales of small lots for spot shipment have been made on the basis of $28, maker's mill. There is not much inquiry for Steel, consumers being pretty well covered by contracts. It is reported that another lot of German Billets has been shipped into the Youngstown district at about $27.50, delivered. Basic Open Hearth Billets for prompt shipment are said to have sold up to very close to $30, at maker's mill.

Muck Bars.—The market on Muck Bars does not show any improvement, either in demand or price. We quote Standard grades at $28.75 to $29, delivered, buyer's mill, Pittsburgh. We note a sale of 500 tons at $28.75, delivered.

Spelter.—There is not much inquiry, and we quote prime Western grades of Spelter at 4.15c. to 4.20c., Pittsburgh.

(*By Mail.*)

The Iron trade continues in a most satisfactory condition. While no large lots of Pig Iron have been sold in the past week, the market is strong, and small lots of Bessemer readily bring $16 and higher at furnace for prompt shipment. There have been further importations of German Billets, another large lot going to the Youngstown district at $27.50 delivered. Finished Iron and

Steel is firm and tonnage heavy, considering the season of the year. The trouble about deliveries of Coke to the furnaces is nearly over, and it is thought another week or two will see the end of the car shortage.

Sheets.—There is a fairly large volume of new business in both Black and Galvanized Sheets, and the market is strong. We quote No. 27 Black Sheets at 3c. to 3.10c., and No. 28, 3.05c. to 3.15c., depending on the order. Galvanized Sheets are 70 and 10 in large lots and 70 and 5 off in small lots. All these prices are f.o.b. cars, maker's mill.

Ferromanganese.—We continue to quote 80 per cent. domestic Ferro at $52.50 delivered in large lots. Foreign continues to be offered in this market at lower prices. The foreign market on Ferro has been somewhat demoralized for some time, and this accounts for the low prices at which it is being offered here.

Rods.—The market is very strong, and prices seem to be higher. We quote ordinary Bessemer Rods at $34 to $35, maker's mill, prices depending on the order and deliveries wanted.

Plates.—Some heavy contracts have recently been placed by the car builders and shipbuilding yards, and some of the leading Plate interests advise us they are very comfortably filled for the next six weeks to two months. It is believed tonnage in Plates will continue to improve right along, as the impression is very general that prices will not be any lower. Association prices on Plates are as follows: Tank Plate, ¼ inch thick and thicker, up to 100 inches in width, 1.60c. at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days. Small lots of Plates from store are sold on the basis of 1.70c. to 1.75c. for Tank, with the usual advances for the higher grades.

Iron and Steel Bars.—Tonnage is very satisfactory to the mills, all classes of consumers buying liberally and in good sized lots. While there is some talk of higher prices on Bars, it is not believed the large interests would agree to this price, preferring rather to be conservative and hold the market on the present basis. Some of the mills rolling Steel Bars are so well filled up with tonnage they are not promising deliveries inside of 60 days or longer. This is also true of some mills rolling Iron Bars. We quote Iron and Steel Bars at 1.50c. to 1.60c. at mill, depending on the order. For Open Hearth Bars $2 extra is charged. Steel Hoops are 1.90c., base, in carloads and up to 2c. and higher for less than carloads.

Structural Material.—Local mills have recently entered a large tonnage; included in this was the material, about 18,000 tons, for the First National Bank and the Young buildings in Chicago. Three local bridges are to be built, which will require from 5000 to 6000 tons. The proposed Frick Hotel, on Grant street, will also take a very large tonnage. Other jobs are coming up and the outlook is excellent. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inches, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh. Small lots of Shapes for prompt shipment bring from $3 to $5 a ton, or more, higher prices than the above.

Merchant Steel.—Most of the mills are now 30 to 60 days behind in deliveries and are likely to continue so for some time, as tonnage being placed is very heavy, particularly for seasonable Steels. The tone of the market is firm and we quote: Cold Rolled and Cold Drawn Steel Shafting is held at 60 per cent. off in carloads and 55 per cent. off in less than carloads, delivery at all points east of the Mississippi River; Tire Steel, 1.70c. to 1.75c.; Toe Calk, 1.90c. to 2c.; Hammered Lay Steel, 3.75c. to 4c.; Open Hearth Spring, best quality, 2.50c. to 2.60c.; ordinary Sleigh Shoe, 2c. to 2.25c.; Sleigh Shoes, tapered and bent, 2.75c. to 3c.; Tool Steel, 6½c. and upward. On Tool Steel freight is allowed to points east of the Mississippi River.

Merchant Pipe.—The market is disturbed to some extent by quotations from independent Pipe mills, which in some cases are below the regular market. There has as yet been no change in official discounts. For small lots we quote as follows:

Merchant Pipe.	Black. Per cent.	Galvd. Per cent.
⅛ to ½ inch and 11 to 12 inch	61	48
¾ to 10 inch	68½	56
Casing, Random Lengths.	S. & S.	I. J.
2 to 3 inch	58	53½
3¼ to 4 inch	63	59
4¼ to 12½ inch	65	61½
Casing, Cut Lengths.	S. & S.	I. J.
2 to 3 inch	53½	59
3¼ to 4 inch	59	55
4¼ to 12½ inch	61½	57½

As noted, some mills are naming lower prices than the above, and prices quoted to jobbers are also lower.

Boiler Tubes.—The market is firm and the mills are well supplied with orders. Prices in small lots are as follows:

Boiler Tubes.	Up to 22 feet. Per cent.
Steel.	
1 inch to 1¾ inch and 2¾ inch to 5 inch, inclusive	65½
2 inch to 2½ inch, inclusive	60
6 inch and larger	59
Iron.	
1 inch to 1½ inch and 2½ inch	43½
1¾ to 2¼ inch	43
2¾ to 13 inch	53

Connellsville Coke.—Of the 21,578 ovens in the Connellsville region, 20,253 were active last week and 1325 idle. The output, as given by the *Courier*, was 206,545 tons and shipments 11,181 cars. We quote strictly Connellsville Furnace Coke at $2.25 and 72-hour Foundry at $2.75 to $3 a ton on contracts for extended delivery. Main Line Coke, made outside the Connellsville region, is sold at slightly lower prices.

Skelp.—There is perhaps a little more inquiry, but as yet there has been no improvement in prices. We quote as follows: Grooved Iron Skelp, 1.70c. to 1.75c.; Sheared, 1.75c. to 1.80c.; Grooved Steel Skelp, 1.75c. to 1.80c., and Sheared, 1.80c. to 1.85c.

Iron and Steel Scrap.—The efforts of the mills to keep prices of Scrap down have not been very successful and the tendency of the market is decidedly upward. We note a continued large demand for Heavy Melting stock. We quote No. 1 Wrought Scrap at $16.50 to $17 net ton; Busheling Scrap, $12.50 to $13 gross ton; Heavy Melting Stock, for which there is a very active demand, $17.50 to $18 gross ton; Old Iron Rails, $22 to $23 gross ton.

The Crucible Steel Company of America of Pittsburgh have leased all of the thirteenth and part of the fourteenth floors in the new Frick Building.

New York.

NEW YORK, January 22, 1902.

Pig Iron.—There has been a moderate amount of buying in this district, and the market continues firm. We quote for Northern Irons: No. 1, $16.50 to $17.50; No. 2 X, $16 to $16.50; No. 2 Plain, $15.50 to $16; Gray Forge, $15 to $15.25; Tennessee and Alabama brands, No. 1 Foundry, $16.25 to $16.75; No. 2 Foundry, $15.75 to $16; No. 1 Soft, $16.25 to $16.75; No. 2 Soft, $15.75 to $16; No. 3 Foundry, $15.25 to $15.50; No. 4 Foundry, $14.75 to $15; Gray Forge, $14.50 to $14.75.

Steel Rails.—The order of the Mexican Central Railroad for 35,000 to 40,000 tons has been placed, the whole quantity going to foreign mills. Report has it that a large order for the Kansas, Mexican & Orient Railroad has also been captured by foreign makers. Small lots of foreign Rails have been sold for Pacific Coast delivery, and further larger transactions are pending. The new Sault St. Marie plant, on the Canadian side, is also soliciting business. We continue to quote $28 for Standard Rails at Eastern mill.

Structural Material.—Bids on the Rapid Transit power house, which were to be opened yesterday, will be taken up for consideration to-day. The demand for Structural Material all over the country continues exceedingly heavy. Among the larger transactions of the American Bridge Company in December and in this month, not already mentioned, are the following: 26 bridges for the Erie Railroad, 4300 tons; requirements of the Lehigh Valley, 7500 tons; for the Delaware, Lackawanna & Western, 4100 tons; for two bridges on the Pennsylvania, west of Pittsburgh, 3500 tons; for the Saw Mill Viaduct of the Pittsburgh extension of the Wabash, 600 tons; for the Northern Pacific, 1000 tons; the Peoria & Eastern, 900 tons; the Rock Island, 2500 tons; the Gulf, Colorado & Santa Fé, 950 tons; the Texas Pacific, 1150 tons, and the final contract for the new Rock Island depot, 3500 tons. Among the buildings we note 1300 tons for the extension of the Detroit shops of the American Car & Foundry Company; for the new works of the Tube Steel Company of Wheeling, 1250 tons; for furnace work for the Colorado Fuel & Iron Company, 1100 tons; for the Philadelphia warehouse of the Pittsburgh Plate Glass Company, 1200 tons; a St. Louis Department store, 1300 tons; the Pennsylvania office building and hotel in Philadelphia, 3500 tons, and the Æolian Building in New York, 700 tons. The Newtown Creek bridge calls for 3750 tons. Prices are quoted as follows at tidewater: Beams, Channels and Zees, 1.75c. to 1.80c.; Angles, 1.75c. to 1.80c.; Tees, 1.80c. to 1.85c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.78c. to 1.85c. for Tank. 1.90c. to 1.95c. for Flange, 2c. to 2.05c. for Fire Box. Charcoal Iron Plates are held at 2.40c. for C. H. No. 1, 2.90c. for Flange, and 3.40c. for Fire Box. Refined Bars are 1.65c.; Soft Steel Bars, 1.70c.

Metal Market.

NEW YORK, January 22, 1902.

Pig Tin.—Under manipulating influences the London market advanced considerably during the last week. The highest figure was reached yesterday, when spot touched £108 10s. The London advance had somewhat of a stimulating effect on this market, but the advance here was in no wise commensurate with the rise in London. The highest price reached here for spot was 24¼c., which was quoted yesterday. As a matter of comparison, it should be remembered that last week, when London was quoted only £104 17s. 6d., the price here was 23¾c. to 24¼. The closing prices to-day were as follows: Spot, 23⅝c. to 23⅞c., and January, 23¼c. to 23⅜c. London weak at £106 for spot, and £103 for futures. Arrivals here during the last few days were very heavy, and to date the arrivals this month aggregate 2590 tons. The Banca sale will be held on the 30th inst. The sale will consist of about 2500 tons.

Copper.—Prices have declined a shade further. While last week the nominal quotation was 11⅛c. and was so quoted on the New York Metal Exchange, the price quoted to-day is 11c., flat. Electrolytic is quoted 10⅞c. and Casting 10¾c. While in some quarters it is said that these prices are being shaded slightly, it is also held that a fair business in prompt delivery is being transacted at these figures. The market is open, however, and the large producers are following up inquiries very closely, mutilating any quoted figure in order to capture the orders. There really are no established market figures. Those quoted by the New York Metal Exchange indicate a basis toward which producers' transactions approximate. London closing quotations to-day were as follows: Spot, £48; futures, £48 2s. 6d. Best Selected, £53 10s., an advance of 10 shillings. The exports so far this month amount to 7200 tons, of which about one-half went to Liverpool. It is said in the trade that this metal is against short sales made on the London Exchange in November and December by American interests.

Pig Lead.—This market is very dull and uninteresting, but in London there was an advance from £10 7s. 6d. of last week to £10 16s. 3d. this morning. Prices here are unchanged, the American Smelting & Refining Company selling on a basis of 4c. for Desilverized, New York, and 3.95c. St. Louis.

Spelter.—The market is very dull, and prices have declined. This market is quoted 4.27½c. and St. Louis telegraphs 4.10c. The demand is very light. London closed to-day £16 15s. It is generally conceded that the latest attempt to consolidate the important Spelter producers has proved a failure. The options have expired, and nothing is being done at present.

Antimony—Is unchanged. Hallett's is quoted 8c. to 8¼c., Cookson's, 10¼c., and outside brands, 7½c.

Nickel.—Ton lots are quoted at 50c. The market is unchanged.

Quicksilver.—Prices are on a basis of $48 per flask of 76½ lbs. in lots of 56 flasks or more.

Tin Plates.—The market is entirely unchanged. The American Tin Plate Company are quoting for delivery until July 1 on a basis of $4.19 per box of standard 100-lb. Cokes, f.o.b. New York, or $4 f.o.b. Pittsburgh.

John Stanton reports the copper production in the United States and of the foreign reporting mines and United States exports as follows, in gross tons of 2240 lbs.:

	Reporting mines.	Outside sources	Total U.S. product.	Product foreign mines.	U. S. exports.
First half 1895....	70,612	9,100	79,712	42,484	34,215
Second half 1895...	84,885	6,600	91,485	43,674	30,507
Total 1895.....	155,497	15,700	171,197	86,178	64,722
First half 1896....	94,180	7,200	101,380	42,255	58,216
Second half 1896...	95,314	7,200	102,514	43,941	67,287
Total 1896.....	199,494	14,400	203,894	86,196	125,503
First half 1897....	103,651	5,000	108,651	44,263	64,870
Second half 1897...	100,555	6,900	107,455	44,007	64,340
Total 1897.....	204,206	11,900	216,106	88,270	129,210
First half 1898....	112,687	7,800	120,487	40,880	68,284
Second half 1898...	103,535	10,250	113,785	43,674	76,831
Total 1898.....	216,222	18,050	234,272	84,554	145,115
First half 1899....	111,987	12,500	124,487	43,629	56,460
Second half 1899...	118,818	18,900	137,719	45,611	63,351
Total 1899.....	230,806	31,400	262,206	89,240	119,811
First half 1900....	114,177	20,400	134,577	43,153	90,747
Second half 1900...	113,810	20,400	134,104	46,278	69,335
Total 1900.....	227,987	40,800	268,681	89,431	160,082
First half 1901....	112,794	20,600	133,394	46,847	50,027
July, 1901.....	18,585	3,400	21,985	9,254	6,824
August, 1901.....	19,267	3,400	22,667	8,180	6,840
September, 1901....	18,080	3,500	21,580	9,477	6,419
October, 1901.....	20,498	3,600	24,098	8,960	8,016
November, 1901....	18,128	3,600	21,728	8,846	6,069
December, 1901....	16,003	3,800	19,803	8,677	10,171

The statement that the Youngstown Iron, Sheet & Tube Company, Youngstown, Ohio, makers of wrought iron and steel sheets and pipe, black and galvanized, were rolling scrap from which to make sheets to cover their buildings is incorrect. When their buildings were being erected they endeavored to purchase pure puddled iron sheets free from scrap, but were unable to do so. Failing in this, they decided to make puddled iron sheets in their own mills for covering their buildings. This concern will make a specialty of the manufacture of puddled iron sheets for the open market free from scrap.

The Chicago House Wrecking Company have completed plans for a large addition to their establishment at Thirty-fifth and Iron streets, Chicago. They will erect a steel frame building, 135 feet wide by 575 feet long, and to be 60 feet high. It will be used largely as a machine shop and boiler house. The business of this company in the machinery line has increased remarkably, requiring much more space than has hitherto been available for this purpose. The most modern tools and appliances will be installed in the machine shop to enable the company to engage extensively in the manufacture of machinery. They expect to have one of the largest machine shops in the country.

Several new lodges of the Amalgamated Association of Iron, Steel and Tin Workers have been organized in the Mahoning Valley district during the past week. A number of new sheet mills have recently been started in the Youngstown district, and the new lodges have been formed among the employees of these new mills.

Edward L. Hinman, president of the Brown, Hinman & Huntington Company, Columbus, Ohio, died suddenly in that city on the 7th inst.

The Philadelphia Machinery Market.

PHILADELPHIA, January, 20, 1902.

Almost without exception the volume of trade during the month of December, 1901, is reported to have been the best for that month in many years. There seemed to be almost no diminution of business in machinery circles during the Christmas holidays, and trade was active right up to January 1, after which there was a slight falling off, but only in some lines. This was not more than could be reasonably expected, as many of the manufacturers were at that time taken up with their annual stock accounts. This condition, however, was only for the time, and as the month advanced trade resumed its former activity. Manufacturers in every branch of the trade continue busy and order books are said to be in a very satisfactory condition. In many cases active work is assured for four to six months ahead, while some manufacturers are covered for the production of their plants for the entire year. Inquiries continue good and are of a nature which bespeak confidence in the future. There are some fairly large sized inquiries in the market and much business carried over from last year will, it is said, be placed at an early date. The various railroad companies as well as large manufacturing interests have been active inquirers.

Foreign demand continues inactive. In some lines, however, a regular business is being transacted, which to the manufacturers interested remains quite satisfactory. A large part of the manufacturers, however, have as much domestic work on hand as they can well handle and are not making very strenuous efforts to secure export trade, and conditions abroad are in many cases also unfavorable to this trade at the present time.

Deliveries are practically unchanged. Some builders of machinery could only accept orders for long time delivery, while others can make fairly prompt shipments. The latter is particularly the case in lines of standard tools, stocks of which on dealers' and manufacturers' floors are in fairly good quantity.

The various foundries, both iron and steel, continue extremely busy, and deliveries from these sources are not much improved. In the case of steel castings deliveries have hardened to some extent, while some of the gray iron foundries have been able to improve the time of delivery slightly.

In the lines of heavy machine tools, cranes and general heavy machinery, activity continues unabated. The condition of the market for these lines is very firm and deliveries do not materially improve. There has been some inquiry for special tools of large size, and orders for the standard lines have been numerous.

The manufacturers of the smaller tools, engines, boilers and machine shop supplies have had a very satisfactory month's business. The demand in these lines keeps up and nearly all the various manufacturers and dealers continue extremely busy.

The various ship yards and the local locomotive builders are operating their plants to the fullest capacity and record productions in tonnage are being produced.

Prices generally remain fairly uniform, and with the present amount of business in the market it would seem that they could hardly be otherwise. The stiffening prices of some raw materials will also, no doubt, have its effect on the market. Some dealers, however, advise us that the recent advances in various lines of machinery are not being strictly maintained.

Mayer & Co., manufacturers of files, Twentieth and Allegheny avenue, have had plans prepared, and bids have been invited for additions to their present plant. The improvements, when completed, will enable them to triple the present output. They are in the market for the necessary machinery and tools for the equipment of this new addition, such as presses, file making machines and general machine tools.

The Philadelphia Machine Tool Company have recently shipped one of their new improved 2000-pound capacity cement testing machines to parties in New York. A number of their standard presses have also been shipped for Western and for New York State delivery. All departments of their plant are busy, and a large amount of hydraulic work is in course of erection. Inquiries are reported to be satisfactory, and trade conditions generally are considered very favorable.

Plans for the new plant of the Philadelphia Pneumatic Tool Company have been completed, and estimates are now being received for same. The plant will be located at Twenty-first and Lippincott streets (below Allegheny avenue), covering 120 x 225 feet; the main building being 96 x 130 feet. The company advise us that they have made decided improvements in their riveting hammers, making them more powerful and lessening vibration. Inquiries and orders for their various pneumatic tools are said to be quite satisfactory, and considerable foreign trade is being done in England, Belgium and France. Particular activity has developed in their line of pneumatic rammers for concrete work, ten of which are now in operation on the new water filter beds at Shawmont, Philadelphia, Pa.

W. E. Shipley, metal working machinery, reports a very active month. The volume of inquiries is being well maintained, and a number of good orders have recently been booked. A large shaper is to be delivered to the Reading Iron Company, Reading, Pa., and two lathes, one a 30-inch, the other a 36-inch, are for the Scranton plant of the Allis-Chalmers Company. A number of planers have also been delivered to the Baldwin Locomotive Works, Philadelphia, Pa.

The Franklin Machine Works, Incorporated, are running all departments of their plant to the fullest capacity. Inquiries are very numerous, and some nice business has been placed on the books. Among some of the recent deliveries made may be mentioned: One No. 2 horizontal floor boring milling and drilling machine, with special spindle, for the Lodge & Shipley Machine Tool Company, Cinicinnati, Ohio; one No. 3 slab milling machine, for the H. B. Smith Machine Company, Smithville, N. J., and one No. 1 cold saw cutting off machine for Curtis & Curtis, Bridgeport, Conn.

The Tabor Mfg. Company continue busy on their general line of molding machines. Last year's business is reported to have been of a satisfactory nature, and the volume greater than any previous year. Inquiries are numerous, and some good orders have recently been booked both for foreign and domestic delivery.

Two 12 x 22½ inch machines have been ordered by J. Hartley & Co., Manchester, England; while two split pattern machines, one 16 x 26 inch and one 16 x 20 inch, will be shipped to Schuchardt & Schutte, Brussels; six split pattern molding machines for air brake cylinders and reservoirs have been shipped to the New York Air Brake Company, and a 30-inch square machine is building for the General Electric Company. Orders for nine pairs of hard ramming and six vibrator frame machines have been received from the Buckeye Malleable Iron Company, Columbus, Ohio; the D. M. Osborn Company have ordered a power rammer, and the McCormick Harvester Company have ordered two power rammers and vibrator frame outfit.

Thomas H. Dallett & Co. report a very satisfactory condition of trade. Inquiries have been numerous, and a satisfactory number of orders have been booked. Recent shipments include one of their new five spindle horizontal multiple boiler drills, electrically driven, for the Babcock & Wilcox Company, Bayonne, N. J. A number of electric portable and rope driven portable drills have also been shipped to local and nearby parties.

The American Pulley Company are now making their all wrought steel parting pulleys, from 6 inches up to 42 inches in diameter, with 2 to 12 inch face for pulleys up to 24 inch diameter, and 4 to 16 inch face for those above 24 inches in diameter. The sizes above 24 inches, for which the dies were made during 1901, are now being placed upon the market as fast as they can be made. The sales of the American pulley during 1901, in the particular sizes made during the preceding year have, we are advised, increased over 40 per cent. Inquiries from both foreign and domestic sources have been numerous, and a satisfactory number of orders has been booked. Recent foreign deliveries include 1700 American pulleys of various sizes for the equipment of the British Westinghouse Electric Company's

shops in England. A large number was also furnished the Woolwich Arsenal in England, while 360 have been shipped for general delivery to various English concerns. The domestic shipment continues in good volume, carload lots going forward for San Francisco, Cal., and for the Middle West deliveries.

The Energy Elevator Company are busy in all the different branches of the trade. The past year has been a very successful one, and 1902 promises even better results. Recent deliveries include a heavy power freight elevator installed in a factory at Summerdale, Philadelphia, and a heavy freight lift was shipped to Kingston, Canada. An order for a large freight elevator for Idaho Falls, Idaho, delivery, has been received and a large number of permits for the installation of elevators for local parties has been taken out.

The Link-Belt Engineering Company are equipping their entire shops with the Renold silent chain driven electric motors, and will abandon the line shaft method of power transmission. General business conditions are reported excellent. Inquiries continue numerous and a satisfactory number of orders has been booked. Recent shipments of transmission machinery include a full equipment for the handling of sugar cane at Carocas, Cuba.

Dienelt & Eisenhardt have completed the addition to their foundry (previously mentioned in these columns), and are now occupying the same. This improvement gives them much needed facilities for the handling and cleaning of castings as well as for general foundry work. The various departments of their plant continue quite busy, particularly in the foundry.

Work on the additions to the foundry of the Harrison Safety Boiler Works is progressing favorably, and when completed will add materially to their facilities in that department. Trade conditions are reported as very favorable, some export business is being done in England and domestic orders are numerous.

The Tacony Iron Works, formerly the plant of the Tacony Iron & Metal Company, State Road and Magee Street, Tacony, Philadelphia, recently began operations. The casting department is the only one in operation at this time, but it is expected that the various other departments will be put into shape for active work as soon as alterations, repairs, &c., can be completed.

The J. W. Paxson Company report very good condition of trade. Considerable work in the way of foundry equipment is on the books, while continued activity is noted in the department of foundry supplies.

Continued activity is to be noted at the plant of the Baldwin Locomotive Works, where every department is being operated to its very fullest capacity. The equipment of the new cylinder finishing shop is being pushed forward as rapidly as conditions will allow. Inquiries continue favorable and a large amount of work has been booked. The past year's output of the plant reached a total of 1375 locomotives of various types, which is not only a gain in actual number over the production of 1900, but a further gain in the fact that the average weight per locomotive was fully 10 per cent. greater than those of last year. Among recent orders may be mentioned 80 engines of various types for the Southern Pacific Railway Company, and ten compressed air locomotives for the Consolidated Coal Company of West Virginia. Shipments are going forward regularly; one engine a day is being delivered to the Pennsylvania Railroad Company. Six locomotives of the heavy freight type have been shipped to the Illinois Central Railroad, and one Atlantic type passenger engine is building for the same company. The Baldwin Company now employ over 11,000 workmen in their local plant, and they expect to maintain that total throughout the year.

The Canadian Niagara Power Company have awarded the contract for the construction of their new wheel pit to Dawson & Reilly of St. Catharines, Ontario. The cost of the work will be over $500,000. This new pit will be 175 feet long, 160 feet deep and 20 feet wide approximately. It will be cut through solid rock of about the same nature as the two big wheel pits on the New York side at Niagara. With the award of this contract the Canadian Niagara Power Company have now over $1,000,000 worth of work under contract. Work on the new tunnel on the Canadian side is progressing. A large circular cofferdam has been built by Contractor Barry. As soon as things are in readiness, Dawson & Reilly will put a big force on the wheel pit work.

The New York Machinery Market.

NEW YORK, January 22, 1902.

Business was good. The week was somewhat of an improvement over the one previous. The ordinary local demand was right up to the brisk pace set shortly before the close of last year. But none of the extensive contracts were closed. Comment in the trade is centered in the strange fact that these large deals are being persistently held off, and to emphasize the peculiarity of the situation is a constantly growing inquiry. During the last week inquiries were very heavy. On all sides the market shows firmness as to values. No changes in prices have, however, been made. The holding back of the large work has made some of the manufacturers and merchants a little nervous regarding the future.

Machine Tools.

One of the largest machine tool lists issued in some time has just been prepared by the commanding officer of the Springfield Armory, Springfield, Mass. The bids will be opened at noon on Feb. 12. A summary of the list follows:

One hundred and twenty-four (124) No. 2 Lincoln milling machines; bed 42½ inches long, 12⅝ inches wide and 6 5-16 inches deep; length of head, 17 inches; each machine to be complete with countershaft, but without vise.

One hand milling machine, large Brainerd or equal; like one now in use at this armory.

One vertical face milling machine, Pratt & Whitney Company's make or equal. Distance from center of spindle to column, 9¾ inches; vertical adjustment of knee, 22 inches; greatest distance from end of spindle to table, 27 inches; vertical feed of spindle, 11 inches; diameter of largest cutter that can be used, 8¾ inches; the spindle provided with automatic feed.

Three (3) universal milling machines, Becker Brainerd No. 4½ or equal. Each machine to be a duplicate of one now in use at this armory.

Seventeen (17) Pratt & Whitney Company's No. 3 rifling machines, each to be complete with oil pumps, connections and countershaft. These machines are for rifling the caliber 0.30 barrels, which are 30 inches long.

Eight (8) No. 1 two-spindle profiling machines; dimensions of table, 10½ x 8 inches; distance from top of table to cross head slide rack, 3½ inches; distance from top of table to cross head, 5 inches; distance from centers of spindles to guide pin, 3 inches; vertical movement of spindle slide, 2½ inches; each machine to be complete with countershaft, but without former cutting device.

Thirty-one (31) No. 2 two-spindle profiling machines; without former cutting device; dimension of table, 15 x 12 inches; distance from top of table to cross head slide rack, 4¾ inches; distance from top of table to cross head (not the slide), 6¼ inches; distance from centers of spindles to guide pin, 4⅛ inches; vertical movement of spindle slide, 2¾ inches.

Three (3) vertical shaving machines, Bement, Miles & Co.'s pattern or equal: diameter of table, 18 inches; slide, 28 inches long, with automatic feed. Each machine to be a duplicate of one now in operation at this armory.

One tapping machine, a duplicate of one now in operation at this armory or equal: complete with countershaft.

One automatic chucking machine, Cleveland Machine Screw Company's pattern or equal. The machine to have 5 spindles and be capable of reaming a drilled hole 9 inches long and ¾ inch in diameter, and counterboring one end of same 1 inch in diameter and 1¼ inches deep; length of feed of turret spindle, 10 inches. Complete with countershaft and necessary wrenches, but without face plate, chuck or boring bars.

One threading machine, with chasing bar, same as those now in use at water shops.

Twenty-three (23) barrel turning lathes, substantially the same as those now in use at water shops, with such modifications as may be shown in drawings to be furnished.

One chambering lathe, with six spindles in a revolving head, same as now in use at the water shops.

Four (4) weighted engine lathes, without screw or back gears; swing over bed, 10¾ inches; swing over carriage, 5 inches; length of bed, 4 feet; greatest distance between centers, 20 inches; dimensions of spindle front bearing, 1½ x 3 inches; diameter of hole through spindle, ½ inch.

Four (4) plain weighted engine lathes, 12-inch swing; length between centers, 33 inches; without back gears or screw cutting attachment.

Four (4) plain weighted engine lathes, 12-inch swing; length between centers, 33 inches; without back gears or screw cutting attachment.

One plain weighted engine lathe, same as seventh item, with double tool post.

Two (2) gibbed engine lathes, 12-inch swing; length between centers, 33 inches; with back gears and screw attachment to cut 10 threads to 1 inch; reversing lever for screw cutting to be attached to feed apron.

Two (2) hand lathes; split boxes 10-inch swing; length between centers 33 inches; to be fitted with foot trip for live spindle and lever on tail spindle; with clutch and dog on live spindle, as per drawings furnished.

Six (6) 9-inch hand lathes, with back gears and lever tail stock, Pratt & Whitney Company's design or equal; bed to be 3½ feet long; to take 20 inches between centers; width of bed, 4½ inches; depth of bed, 3½ inches; ratio of gearing, 8 5-32 inches to 1 inch; four grades on cone, diameter of largest grade 6 5-16 inches, for 1¼-inch belt; diameter of spindle front bearing, 1⅜ inches; length of spindle front bearing, 2¼ inches; diameter of hole through spindle, ⅜ inch; spindle nose to be of the following dimensions: Shoulder 1⅝ inches diameter, 5-16 inch long, threaded part 1-inch diameter, 10 p. i. and 1 inch long; foot block spindle to be ⅞ inch diameter, 6½ inches long, and to be operated by lever having a movement of 3½ inches.

Three (3) six-spindle horizontal drilling machines, like those now in operation at this armory or equal.

Ten (10) No. 2 four-spindle drill presses, Pratt & Whitney Company's pattern or equal; dimensions of table, 12 x 19½ inches; distances between centers of spindles, 4 inches; diameter of spindle, 1 1-16 inches; for Morse's standard taper No. 2; greatest distance from spindle to table, 16 inches; vertical adjustment of knee, 10 inches; vertical movement of table with rack and pinion, 7 inches; distance from center of spindle to column, 6½ inches.

One single spindle drill press, style of Garvin or equal; distance from spindle center to column face, 6¼ inches; size of table, 14 x 9 inches; hand and foot feet. Oil table, 16 x 11 inches.

One two-spindle drill press, style of Garvin or equal. Dimensions same as tenth item.

One two-spindle drill press; distance from center of spindle to column face, 6½ inches; revolutions of spindles from 200 to 400; both spindles to have same speed.

Three (3) 14-inch three-spindle sensitive drills, Woodward & Rogers pattern or equal, to do work up to ½ inch. The machine to be strong and sensitive and designed with especial reference to the use of drills or tools of different sizes and lengths. The spindles and table to be adjustable up and down, and each spindle to have three changes of speed, independent of each other. The spindles to be of tool steel, ¾ inch in diameter, to have a traverse of 13 inches, and to have taper holes for Morse drill socket No. 1. They must be adjustable by moving the arms, which should be gibbed to the front of the uprights and balanced by weights. The throw of spindle by the feed lever to be 4⅛ inches. A steel rack to be fitted into the slides. The distance from the center of the spindles to the column to be 7 inches. The table to be 25 x 14 inches, and to move the entire length of the column.

Three (3) manufacturers' automatic bench drills, Pratt & Whitney Company's or equal. Machines to be duplicates of those in operation at this armory.

Three (3) case hardening furnaces, Brown & Sharpe Company's pattern or equal. To be duplicates of those now in operation at this armory.

Two (2) drop hammers, complete; weight of hammers, 800 pounds; Billings & Spencer Company's pattern or equal.

Two (2) Bradley cushion hammers (60 pounds), same as the one now in use at the water shops.

Three hundred (300) swivel bench vises, 3½-inch jaws; Parker's or equal.

Eight (8) manufacturers' hand milling machines, with pillar columns and overhanging arm; Whitney Mfg. Company's No. 1 pattern or equal. Each machine to be a duplicate of one now at this armory, with the exception of the hole in the spindle, which should be No. 9 B. & S. Complete with countershaft, but without vises or arbors; to be furnished with large oil cups.

Fourteen (14) upright machines for drilling bolts, similar to the one now in use at the water shops, with the following modifications or improvements: Spindles must be made to fit the chucks now in use. The channel to carry off oil and chips shall have more incline and be longer, so chips may pass off readily, and give more room between carriage wheel and chip pan. The ratchet for holding the carriage to be made of stronger teeth than the one now in use, and to be case hardened. Each rotary pump to be furnished with three separate rates of speed, to be applied whenever the pump loses its force and requires greater speed to attain the necessary pressure. A guard or shield to be put over the pump socket to prevent accident to the workman. Distance between carriage and chip channel slide to be great enough to allow at least 4 inches of drill to be used without changing its position in socket. The quarter turn belt that drives spindle to be so arranged that oil from worm will not come in contact with it in any way.

We are advised by the Columbia Iron Works of Port Huron, Mich., that the buildings of their new shipbuilding plant are being erected, and that the company are now ready to receive offers on the various tools and machines required. J. E. Botsford, president of the company, and also president of the Botsford & Jenks Company of Port Huron and the Port Huron & Duluth Steamship Company, is in charge of the erection of the new plant and the purchase of the equipment.

The J. S. Graham Machine Company of Rochester, N. Y., who suffered a heavy fire loss, are now building new works, which will be double the size of the former plant. Machinery is now being installed, and little delay is expected, as a large stock of machinery remained unharmed.

We are in receipt of details regarding the new shop of the Philadelphia Pneumatic Tool Company of Philadelphia. It has been decided to build the plant on Twenty-first street, Philadelphia, below Allegheny avenue, alongside of the Philadelphia & Reading Railroad. The shop will be one-story, with a basement, 96 x 130 feet, with side extension for boiler house, 24 x 44 feet. The engine room will be located in the basement, where it is expected to install an 80 horse-power engine, together with direct connected generating unit for lighting, &c. The boiler will be 60 inches by 16 feet, of the return tubular type, and there will be a round, hollow tile brick chimney, 70 feet in hight. Walter Smedley of the Stephen Girard Building, Philadelphia, is the architect. The company expect to occupy the building not later than May 1, and are installing a considerable number of new machine tools. This new plant will be easy of access from the central part of the city by train on the Philadelphia & Reading, from the Reading terminal, Twelfth and Market streets, to Twenty-second Street Station on the Norristown Division, or from Broad Street Station to Westmoreland Station on the Germantown Division, Pennsylvania Railroad, or it can be reached by trolley cars of the Eighteenth and Twentieth street lines, which run out to Sansom street. The shop will be equipped with steam heating plant, modern toilet arrangements and lockers for the men and everything to make it a complete modern machine shop in every particular. J. W. Tierney is president of the company.

Extensive improvements are being planned by the McClave-Brooks Company, manufacturers of stokers, grates and steam blowers, with works at Scranton, Pa. The capacity of the present plant is to be enlarged five times by the building of new works. There will be a foundry 250 x 150 feet, two erecting shops 180 x 60 feet each, a stock shop 260 x 100 feet, a pattern shop 70 x 40 feet, and a large pattern storage building, as well as a new office building. As soon as the weather will permit work will be commenced. The new plant will occupy 12½ acres of land, which is on the Delaware, Lackawanna & Western Railroad and the Ontario & Western Railroad. The machinery now in use in the present plant will be transferred to the new plant and a very large amount of new equipment will be required. This will be of the most improved type, as every effort will be made to make the new plant as efficient and modern as possible. Wm. McClave is president of the company, R. G. Brooks vice-president and W. R. McClave secretary and treasurer.

Boilers and Engines.

One of the most interesting topics of the week in this line was the purchase of the power plant equipment for the St. Louis World's Fair. Details are printed in another column.

The Auburn Inter-Urban Railway Company are now purchasing their equipment. This company, it will be recalled, have their headquarters at Auburn, N. Y., and their line is to connect Albany and Geneva. The station will be of 1500 horse-power.

The power plant and mechanical equipment of the new New York Custom House is now being purchased. John Pierce, whose offices are located in the Broadway Chambers, corner Broadway and Chambers street, is subletting the contracts for the mechanical equipment.

The Princeton Electric Light Company closed on their engines, placing the contract with the Harrisburg Foundry & Machine Company.

The Central Brewery Company bought Watertown engines. The equipment, it will be recalled, includes 700 horse-power.

One of the largest complete equipments purchased last week was for installation in R. H. Macy & Co.'s new store, which is now under construction at Broad-

way and Thirty-fifth street, New York City. The plant will have a capacity of 2000 kw., entirely for lighting purposes, as but a very small portion of it will be called into requisition for operating the ventilating apparatus, pneumatic cash carrier system and some small pumping equipments. The elevators to be installed in the building will be worked by hydraulic power. The generators, consisting of four direct current, 110-volt direct connected machines of 400 kw. each, and two equipments of a similar description, having a capacity of 200 kw. each, have been ordered from the Western Electric Company of New York City. The contract for the engines intended to drive the larger generators calls for Rice-Sargent machines, four compound Corliss type having a nominal capacity of 600 horse-power each. They will be built at the Providence Engineering Works of Providence, R. I. The engines for operating the two 200-kw. generators will also be of Corliss type single valve, of 320 horse-power each. These, however, have not yet been contracted for, nor have the 1500 arc lamps and 6000 incandescent lamps of 16 candle-power each, which will be required. The contracts for the equipment are being handled by Mr. Comstock, head of the electrical department of the George A. Fuller Company, 137 Broadway, which concern are constructing and equipping the building, in conjunction with Mr. C. O. Mailloux, the electrical engineer of the R. H. Macy Company. The boiler equipment is to be 2600 horse-power, comprising four batteries of 500 horse-power each and two batteries of 300 horse-power each. This contract has been undertaken by the Babcock & Wilcox Company of New York City. The pumping equipments are to be of Laidlaw-Dunn Gordon type, the contract having been allotted to the International Pump Company of New York City. Mr. Quay, the Fuller Company's chief mechanical engineer, in concurrence with Mr. Reginald P. Bolton, the Macy mechanical expert, placed the contracts.

Miscellaneous.

John A. Williams, president of the Dawson City Mining Company, placed an order with H. E. Maxfield, New York representative of the Lawrence Machinery Company, having offices at 39 and 41 Cortlandt street, for 20 sets of centrifugal pumps. The pumps will be of the series compound belt driven type. They will work against a head of 350 feet, discharging 12,000 gallons of water per minute. Mr. Maxfield also captured the order for the pumps required by the New York Glucose Company of Shadyside, N. J. This contract calls for 47 belt driven centrifugal pumps, varying in capacity from 200 to 2000 gallons per minute. Thirty-one of the pumps will be constructed entirely of phosphorus bronze, and will be used for circulating sulphurous acids through tanks.

Considerable new equipment will shortly be required by the recently organized West End Paper Company, Carthage, N. Y. They have purchased the plant of the West End Pulp & Casket Company, which they will enlarge by the erection of a new machine room, plans for which are not yet complete. The product will be news and manila paper exclusively. F. O. Wilder is secretary and treasurer.

J. J. Kennedy, engineer, of 52 Broadway, N. Y., is installing a 20,000 horse-power hydraulic electric plant in North Carolina. The plant will cost upward of $3,000,000, none of the mechanical equipment having been purchased as yet.

The Hyatt Roller Bearing Company of Harrison, N. J., have just closed the most successful year since their business was established some eight years ago. The sale of their product has increased to such an extent as to render the present quarters entirely inadequate, and they have therefore leased the three-story factory formerly occupied by the Bowers Mfg. Company, which is directly opposite their present plant, in order to extend the shafting bearing department, the capacity of which has been particularly taxed. The plant is running night and day in order to complete a number of very heavy contracts which were closed last fall. It is expected that another factory building will be erected adjoining their present plant in the spring.

Government Supplies.

Following are the machinery bids received at the Navy Department January 14:

Mare Island.

Bidder 1. American Ship Windlass Company, Providence, R. I.
6. Henshaw, Bulkley & Co., San Francisco, Cal.
7. Handlan Brick Mfg. Company, St. Louis, Mo.
10. Williams, White & Co., Moline, Ill.
16. Herron, Riccard & Macomb, San Francisco, Cal.
24. New Jersey Foundry & Machine Company, New York City.
28. Fairbanks Company, New York City.
30. W. H. Foster, New York City.
41 Drew Machinery Agency, Manchester, N. H.
49. Bertsch & Co., Cambridge City, Ind.
51. U. Baird Machinery Company, Pittsburgh, Pa.
56. Pacific Tool & Supply Company, San Francisco, Cal.
57. Niles Tool Works Company, Hamilton, Ohio.
58. Manning, Maxwell & Moore, New York City.

Class 30. One reversible steam winch—Bidder 1, $1225; 24, $1267.75; 16, $1345.

Class 31. One 36-inch single punch and shear—Bidder 10, $1090; 49, $1100; 6, $1297; 7, $1400; 58, $1400; 30, $1470; 51, $1490; 16, $1978.

Class 32. One 16-inch quick acting punch—Bidder 6, $480; 10, $430 and $350; 49, $500; 7, $520; 58, $619; 30, $682.50; 51, $690. 16, $838.

Class 33. One universal splitting shears—Bidder 49, $600, $485 and $550; 6, $600; 7, $625; 58, $850.

Class 34. One horizontal combined punching and shearing machine—Bidder 6, $1050; 58, $1250.

Class 35. One 2-inch water press—Bidder 58, $935; 6, $1395.

Class 36. One 1½-bolt heading machine—Bidder 6, $2085; 30, $2163; 58, $2540; 7, $2570; 51, $2575; 16, $2682.

Class 37. One 50-inch vertical drill press—Bidder 6, $1070 and $2150; 58, $660 and $530; 28, $685; 51, $715; 16, $740; 57, $1100.

Class 38. One 24-inch vertical drill press—Bidder 6, $198 and $355; 51, $185; 58, $188; 16, $190; 41, $205; 30, $212; 56, $240; 28, $248.

Class 39. One 6-inch full universal radial drill—Bidder 6, $1130, $1460 and $1490; 28, $1700 and 1490; 16, $1190; 58, $1235; 56, $1255; 57, $1300; 30, $1215.75.

Class 40. One radial countersinking wall drill—Bidder 6, $365; 28, $380; 30, $420; 58, $490; 51, $498; 16, $540.

Class 41. One universal cutter and tool grinder—Bidder 56, $295; 6, $368; 58, $380; 16, $418; 30, $636.75.

Puget Sound.

Bidder 1. Wilmarth & Morman, Grand Rapids, Mich.
2. Putnam Machine Company, Fitchburg, Mass.
3. American Hoist & Derrick Company, St. Paul, Minn.
4. Thresher Electric Company, Dayton, Ohio.
5. General Electric Company, Schenectady, N. Y.
6. Henshaw-Bulkley Company, San Francisco, Cal.
7. Brown Hoisting Machinery Company, New York City.
9. Herron, Riccard & Macomb, San Francisco, Cal.
10. Industrial Works, Bay City, Mich.
11. Western Electric Company, New York City.
13. Fairbanks Company, New York City.
16. A. D. Granger Company, New York City.
17. Drew Machinery Agency, Manchester, N. H.
19. Paragon Fan & Motor Company, New York City.
21. U. Baird Machinery Company, Pittsburgh, Pa.
23. Browning Engineering Company, Cleveland, Ohio.
24. Pacific Tool & Supply Company, San Francisco, Cal.
25. Manhattan Supply Company, New York City.
26. Manning, Maxwell & Moore, New York City.
27. Mitchell, Lewis & Staver Company, Seattle, Wash.
28. Jas. O. Bradley, Tacoma, Wash.
29. S. E. Brown & Co., Seattle, Wash.
30. J. & B. Hunt Company, Seattle, Wash.
31. Northern Electrical Mfg. Company, Madison, Wis.

Class 1. For the installation of a steam heating system in the general storehouse—Bidder 30, $2515; 29, $3298.

Class 2. One locomotive steam crane—Bidder 19, $5950; 28, $5950; 23, $6200; 3, $6670; 7, $7091.

Class 7. One 5 horse-power motor—Bidder 19, $218.75; 11, $234; 4, $265; 5, $296; 17, $315; 31, $390; 9, $925.

Class 8. One stationary stop engine with automatic governor—Bidder 9, $168; 16, $293; 6, $315.

Class 9. One back geared screw cutting engine lathe—Bidder 28, $974; 24, $1045; 26, $1125; 9, $1320.

Class 10. Modern tool room lathe with compound rest and taper attachment—Bidder 2, $440; 9, $458; 13, $490; 26, $475; 6, $515; 24, $515.

Class 11. One 16-inch triple quick return crank shaper—Bidder 2, $420; 24, $525; 26, $580; 6, $675.

Class 12. One 2½-inch combination radial drill—Bidder 21, $525; 26, $574; 13, $586; 28, $592; 24, $650; 6, $660; 9, $669; 17, $700.

Class 13. One combination punching and shearing machine—Bidder 6, $450.

Class 14. One 14-inch sensitive drill with square and box tables—Bidder 13, $52; 9, $53; 25, $54; 24, $65; 6, $70; 28, $88.

Class 15. One power grindstone complete with stone dressing attachment—Bidder 24, $60; 9, $70.

Class 16. One bench emery grinder—Bidder 6, $67; 9, $79; 21, $90; 25, $148.80; 24, $150.

Class 17. One twist drill grinder for grinding drills from ⅛ to 2¼ inches—Bidder 6, $68; 21, $70; 9, $73; 26, $75; 24, $75; 27, $77.90; 25, $78.90; 1, $75.10, $104.15 and $136.53.

Manning, Maxwell & Moore were the only bidders on the 32-inch motor driven shaper included in the list of supplies for the Boston Navy Yard, bids for which were opened January 14. Their bid was $1595.

Pumping Machinery.

Proposals will be received until February 14 by Earl W. Taylor, Quartermaster, Fort Fremont, South Carolina, for installing water and sewer system, including pump house, pumping machinery, tanks, distributing mains, &c., also detached lavatory at this post.

Coal Handling Machinery.

Proposals will be received at the Bureau of Yards and Docks, Navy Department, Washington, until 1 p.m., February 15, for furnishing and erecting steel work for a roof and furnishing and installing certain coal handling machinery at the navy yard, Washington, D. C. Estimated cost, $18,000. Plans and specifications can be seen at the Bureau or will be furnished by the commandant, navy yard, Washington. Mordecai T. Endicott is Chief of Bureau.

Steel Plate Exhaust Fans.

Captain John Stephen Sewell of the corps of engineers, United States Army, Washington, D. C., invites bids to be opened February 3 for furnishing and erecting complete on foundations provided by the Government 12 electrically driven steel plate exhaust fans. They shall be direct connected with electric motors with inlet opposite to the motor, provided with vertical discharge and to be right hand. The motor and fan to be mounted on cast iron or steel base. There will be required slow speed direct connected motors as follows: One 5 horse-power, one 10 horse-power, two 15 horse-power, eight 20 horse-power, multipolar type.

Power Plant for Government Hospital.

The superintendent of the Government Hospital for the Insane has submitted to Congress through the proper channels a communication requesting that the estimate of appropriation for the installation of a central heating and power plant for the hospital be increased from $150,000 to $247,604.

The superintendent submits communications from the architects and contractors, and says: "This correspondence all refers to the estimated cost of the central heating and power plant for the hospital, for which an estimate of $150,000 was included in the estimate submitted with the last annual report. This estimate was only an approximate one, and made without any reliable date to guide us. As shown by the inclosed correspondence the amount stated by the architects and engineers to be necessary is considerably in excess of this sum—to wit: $247,604. This estimate does not include architects' and engineers' fees, which will be 5 per cent. of this amount, $12,380.20, making a total amount of $259,984.20, or in round numbers, $260,000."

The various charges are itemized as follows: For the heating plant, which includes everything outside of the present contract for piping the buildings, $124,000; for the engines and generators, $35,000; for switchboard, $4500; for wiring, $12,000; for the power house, $23,000; for the chimney, $14,745; for 4750 linear feet of tunnel, 4 feet wide and 5 feet high, at $7 per linear foot, $33,250; total, $247,604.

The Department of Justice Building.

Another bill has been presented to the House for the construction of a new Department of Justice Building, which provides for the purchase of an entire square and the construction of a building thereon. The bill also provides that the Secretary of the Treasury be further authorized and directed to cause to be erected on the site a suitable building decided upon at a cost not exceeding $3,000,000.

The American Tube & Stamping Company.—The Wilmot & Hobbs Mfg. Company give notice that they have sold out as of January 1 their entire business and property, subject to the liabilities, to the American Tube & Stamping Company of Bridgeport, Conn. This year the new company will be making Swedoh steel billets in their new open hearth furnaces and blooming mill, and possibly large steel castings, thus assuring an adequate supply of raw material. In the press and stamping business they contemplate continuing the policy of refraining from competing with the customers of their rolling mill department. The officers of the company are: Frank A. Wilmot, president and treasurer; Albert N. Stanton, vice-president; Clarence D. S. Miller, second vice-president; Henry W. Nutt, secretary, and Albert J. Middlebrook, assistant treasurer.

Iron and Industrial Stocks.

The past has been a rather quiet week in the issues of the steel stocks, and fluctuations have been within a narrow margin. An interesting statement is expected to accompany the call for the meeting to be issued by the United States Steel Corporation. There has been little news about any of the leading issues.

The first annual meeting of stockholders of the United States Steel Corporation will be held in Hoboken, February 17. Among matters to be voted upon are the approval and ratification of all contracts, acts, by-laws, proceedings, elections and appointments by Board of Directors of the Executive Committee or the Finance Committee since the organization of the corporation. These include the agreements with J. P. Morgan & Co., syndicate managers, dated March 1 and April 1, 1901, and January 3, 1902, the last being an agreement of final settlement and release; also the election of eight directors to serve for three years. Transfer books close January 25 and reopen February 18.

The annual meeting of the stockholders of the Cambria Steel Company was held at Philadelphia, January 21. Reports covering operations of two and a half months, from August 15 to October 31, showed a net income from all sources of $819,391. From this amount $360,253 has been deducted to cover estimated depreciation, leaving a balance of $459,138 to the credit of income account; $170,637 is credited direct to profit and loss account, as representing income not directly due to operations during the time mentioned.

Dividends.—The directors of the United States Cast Iron Pipe & Foundry Company have declared a quarterly dividend of 1 per cent. on the preferred stock, payable March 1. Books close February 8. The last previous dividend was paid June 1, 1900.

The Colorado Fuel & Iron Company have declared the regular semiannual dividend of 4 per cent. on their preferred stock, payable February 20. Books close January 31 and reopen February 21.

The National Bridge Company have declared the regular quarterly dividend of 1¾ per cent. on their preferred stock, and a dividend of 1¼ per cent. on their common stock, payable February 6. Books close January 29 and reopen February 7.

The United States Cast Iron Pipe & Foundry Company have resumed dividends on the preferred stock.

The International Steam Pump Company have declared preferred stock dividend No. 11, of 1½ per cent., payable February 1.

The Cambria Steel Company have declared the first dividend of 1½ per cent., or 75 cents per share, payable February 15.

Colorado Fuel & Iron Company have declared the regular semiannual dividend for the six months ending December 3 on the preferred stock, payable February 20.

The Riter-Conley Mfg. Company of Pittsburgh, builders of iron and steel structural work, recently sent a number of structural iron workers to Aguascalientes, Mexico. The firm have a contract for building ten copper smelters and six lead smelters for the American Smelting & Refining Company in that place.

A Proposed English Steel Consolidation.

The London *Statist* devotes considerable space to the recently rumored consolidation of British iron and steel companies. It is reported that Guest, Keen & Co., Limited, at Birmingham, South Wales; Bolckow, Vaughan & Co., Limited, of Middlesbrough-on-Tees, and the Consett Iron Company, Limited, in Durham, are to be amalgamated.

These three English concerns named are important ones. The capitalization of Guest, Keen & Co. is £3,000,000, divided equally into 4 per cent. debenture stock, preferred stock and common stock. Of the preferred stock £120,000 and of the common £350,000 has not been issued. The company were themselves a consolidation, taking over the Dowlais Iron Company and Guest & Co. and the Patent Nut & Bolt Company. The properties taken over included collieries with an output of 1,500,000 tons annually, large iron and steel works and large interests in mining properties in Spain. The purchase price in cash for the Dowlais and Guest & Co. was £1,530,000 and for the Patent Nut & Bolt Company £1,000,000, payable £200,000 in cash and £800,000 in debenture stock. The Consett Iron Company were formed in 1864 with a capital of £400,000, which has since been increased to £1,500,000, of which £500,000 preferred and £750,000 common have been actually issued.

The earnings of Guest, Keen & Co. for the year ended June 30 last amounted to £387,065, after payment of all expenses incidental to the formation of the company. This sum, after payments of 4 per cent. for the debenture stock, 5 per cent. on the preferred stock and 10 per cent. on the common stock, left a surplus of £260,843, of which £150,000 was carried to reserve account, leaving £110,843 to be carried forward. The earnings of the Consett Iron Company for a series of years, with the dividends paid, were as follows:

		Dividends on—	
	Profits.	Preferred.	Common
		Per cent.	
1901	£575,088	8	50
1900	672,585	8	50
1899	433,900	8	33 1-3
1898	772,884	8	20

Before paying these dividends the company wrote off for reconstruction of works £50,000 in 1901, a total of £225,000 for the three years. The surplus on June 30, 1901, showed undivided profits of £134,768 and a profit and loss balance of £480,088.

Baldwin Automobile Mfg. Company.

In the courts at Pittsburgh, on Monday, January 20, a schedule of assets and liabilities of the Baldwin Automobile Mfg. Company of Connellsville, Pa., was filed. The liabilities amount to $100,298 and the assets are $98,608. Of the liabilities, $2251 is due for wages; $6500 is in secured claims and $91,547 is in unsecured claims. The claims for wages have been bought, the wages paid and the claims assigned.

All the secured claims are on mortgages on property in Connellsville. There is due to 220 creditors of a general nature $25,514, ranging in amounts from 30 cents to $6892. On 19 notes there is due $64,029. The notes run in amounts from $700 to $10,000. The assets consist of real estate, valued at $71,856; cash, $90.30; note for $6000; stock, tools, &c., $15,000; accounts due, $1658; money due on subscriptions to stock, $4000; fire insurance, $58,000. The latter item, of course, is not a good asset.

The petition was filed against the company on January 22, 1891, and George C. Humbert and Edward W. Boyd were appointed receivers January 24, 1891. They were directed by Judge Joseph Buffington to carry on the business.

The receivers filed an account with the court on December 14, 1891. It showed cash on hand $90.30. The receivers charged themselves with $78,387.73. Of this amount $38,119.32 is the value of the property as appraised and $40,268.41 cash received. The receivers claim credit for $94,762.68. They also claim a depreciation credit of $500 on stock, leaving a balance of $37,619.32. There is a balance due on material purchased of $16,784.95, and the cost of carrying on the business was $40,268.41.

The Pressed Steel Car Company.—At the annual meeting of the stockholders of the Pressed Steel Car Company, held on Wednesday, the 22d inst., at Jersey City, the following balance sheet as of December 31, 1901, was submitted:

Assets.			
Properties and franchises			$25,615,831.76
Additions to plant, 1901			441,771.38
Securities, stocks owned			139,000.00
Taxes and insurance not accrued			18,365.90
Current assets:			
Accounts receivable	$1,813,596.38		
Stock of materials on hand	4,898,272.69		
Cash	1,301,727.85		
			8,013,596.92
Total			$34,228,565.96
Liabilities.			
Capital stock common	$12,500,000.00		
Capital stock, preferred	12,500,000.00		
			$25,000,000.00
Five per cent, first mortgage gold notes, payable $500,000 annually			5,000,000.00
Purchase money mortgage (McKee's Rocks plant)			235,000.00
Current liabilities:			
Accounts payable		1,838,790.98	
Accrued salaries and wages (payable in January)		126,987.26	
Accrued interest (payable February 1)		108,866.66	
Accrued dividend, being the fourth quarterly dividend on the preferred stock, declared		218,750.00	
			2,293,394.90
Surplus:			
Balance, January 1, 1901		1,812,284.84	
Deduct dividends paid on common stock	$500,000.00		
Charges pertaining to previous years	521,403.59	1,021,403.59	
		$790,881.25	
Add: profits for year 1901	$1,927,925.07		
Deduct: depreciation and renewals, $143,635.26; dividend on preferred stock, $875,000.00	1,018,635.26	909,289.81	1,700,171.06
Total			$34,228,565.96

The Colonial Steel Company, who are now erecting a modern plant at South Monaca, Pa., for the production of high grade tools and all other forms of crucible steel have decided to establish warehouses and offices in New York and Boston. The New York warerooms and offices will be located at 43 John street. Arrangements are now being made for the lease of a building in Boston. The entire Eastern business will be handled by Eph. Smith, who had charge of the business of Howe, Brown & Co. of Boston for 11 years. James W. Brown, the chairman of the Board of Directors of the Colonial Company, is well known in the trade, having had the experience of a lifetime in the manufacture of high grade tool steels. He will give his entire attention to this manufacture.

Nothing definite has yet been decided as to the new bridge works of the American Bridge Company in the Pittsburgh district. The plans have been fully worked out, 11 studies having been submitted. It is probable, too, that at no distant day the question of erecting a large works in the Chicago district will be taken up.

A special meeting of the stockholders of the A. Garrison Foundry Company of Pittsburgh, builders of rolls and iron and steel works machinery, will be held in that city on March 24, to vote for or against a proposed increase in the capital stock of the company.

During the year 1901 there were imported into the United Kingdom from the United States 32,372 tons of pig iron, as compared with 94,282 tons in 1900, 80,988 tons in 1899 and 76,356 tons in 1898. The importations of unwrought steel compare as follows: 50,864 tons in 1901, 157,628 tons in 1900, 59,375 tons in 1899 and 29,374 tons in 1898.

HARDWARE.

THE disposition of manufacturers to work in harmony with one another and to cultivate a spirit of mutual confidence is one of the characteristics of the past few years which is bearing good fruit. It is not necessary that it culminate in all cases in combinations or formal agreements relating to prices. In fact, in some instances very satisfactory conditions have resulted without the assistance of these artificial arrangements, which so frequently in the long run have an injurious effect on the lines to which they relate. For many years manufacturers, largely owing to the lack of understanding with one another, have suffered severely from abuses which they themselves frequently inaugurated or encouraged, especially in the periods of depression through which the trade has passed. It is a familiar story how in the scramble for business, each seeking to get all in sight, unwise concessions were made, prices were forced down to an unprofitable level, and the transaction of business rendered perplexing and unsatisfactory. With their feeling of mutual distrust manufacturers occupied a weak position with their customers, realizing that if they refused unreasonable demands some competitor would probably grant the concession and secure the trade.

The coming together of those who had thus been working at sixes and sevens, without acquaintance with or confidence in one another, introduced into several lines an entirely different condition. Competitors met in a social way, questions of management and cost were discussed, frank consideration was given to acknowledged abuses, and plans for improving the situation were considered in a sensible and practical spirit. This not infrequently prepared for some agreement more or less binding which, provided a conservative policy was pursued and it was not attempted to control the market unreasonably, was not in any way injurious to the trade. It was certainly advantageous for the manufacturers and added much to the pleasure of transacting business. This is illustrated in the enthusiastic remark of one of them, who, referring to the good results which have come from such conferences between the manufacturers of a certain troublesome line now in better condition than for a long time, says "the harmony which exists is so thick and strong you might cut it with an Axe."

It might be suggested cynically that it is easy enough to establish and maintain this condition of things in times of great business activity and general prosperity, and that the stress will come when the demand falls off and orders are hard to get—considerations which unquestionably have force. In the meantime, however, the spirit of harmony is desirable in itself, helping manufacturers to take advantage of prosperous times and, when the turn comes, aiding them in meeting less favorable conditions with courage, wisdom and success.

An illustration of the alertness of American manufacturers in following up clews as to openings in foreign markets has been brought to our attention by an export house. We published about a year ago an item referring to the success with which a certain line of goods was being sold in a country in Northern Europe. The result was that the attention of a number of competing manufacturers was directed to this special field, and active measures were taken by them to secure part of the business. Accordingly at this time there are several manufacturers sending goods to that market, and the competition has been such as to lower the price and materially increase the volume of transactions.

The incident is interesting in another way as illustrating the advantage of being early in the foreign field before it is overrun by manufacturers from this country, for in the case referred to it is to be noted that while manufacturers later in entering that field were able to obtain a foothold and find at least something of a market for their products, the bulk of the business continues to be in the hands of the energetic house whose lead they followed. It thus appears that in foreign as in domestic trade the advantage remains with those who are leaders in approved methods or enlarged enterprise. It is only under exceptional circumstances that imitators become anything but followers.

In an address under the title, "At Wholesale," delivered last week before the College of Commerce and Politics at the University of Chicago, A. C. Bartlett of Hibbard, Spencer, Bartlett & Co. declared that 10 pounds of capital are easier to secure in business nowadays than 1 ounce of brains. Continuing, he said:

> Not long ago a young man in the commercial world found capital was hard to secure. Now a young man of brains will have capital seek him. This is exemplified in the business world, in spite of the general opinion to the contrary.

Referring to the requisites for success in wholesale business, Mr. Bartlett mentioned capital, financial ability, a genius for organization, and power to foresee future conditions.

Condition of Trade.

Since the middle of the month there has been an evident increase in the volume of business, and the machinery for the production and distribution of goods is now in full operation. In many lines manufacturers are kept busy on their customers' orders, without much opportunity to accumulate stock. They report the inquiries from the trade as indicating a large volume of business during the next few months. Travelers generally are out and the result of their activity is the sending in of orders, which are referred to as very satisfactory in volume. The trade are disposed to purchase a little earlier than sometimes, in view of the tone of the market, the excellent condition of current business and the possibility that there may after a while be difficulty in obtaining prompt shipments. The changes in price for the week under review are few and for the most part, comparatively unimportant. The stiffening in the Nail and Wire market is having an excellent effect on the trade in general. Manufacturers express some annoyance from delay in obtaining raw material, principally on account of the shortage of cars. The movement of heavy lines is also interfered with from the same cause. The matter of organization among the retail trade will be brought to the front during the coming month, when so many of the associations hold their annual meetings, and questions relating to the welfare of the trade are naturally attracting some attention at this time. The subject of consolidation of jobbing interests is occasionally broached, principally in an interrogatory way. While it is understood that the project is not abandoned and may possibly be awaiting consummation in some form very different from the comprehensive scheme that was originally proposed, it is impossible to obtain anything definite in regard to the plans or operations of its promoters. In the meanwhile there is some talk of consolidation among manufacturers in lines in which up to the present there has been

little indication of harmony or a disposition to work together.

Chicago.

(By Telegraph.)

The great activity in the Hardware trade for the past four weeks has been partly due to special influences. December was enlivened by the cut freight rate to the far West, which enabled shipments of heavy goods to be made at very low rates. This month's trade is swollen by the exceptionally heavy buying of Wire products, due to the stiffening by the manufacturers. Both these influences have had an effect on the general line of Hardware. The great movement in Wire Nails and other Wire products now going on is taking with it a heavy volume of business in shelf goods. Dealers throughout the West are not only sorting up their general stocks, but also seem inclined to anticipate their wants to some extent, having faith in the stability of values. The buying has further been stimulated by the advice given by jobbers in December that it was a good time to purchase anything depending on Steel Billets, because of the great scarcity of steel and the danger of higher prices. Possibly the demand for Hardware might have been good if these conditions had not existed. The country is certainly in very prosperous condition, and no seriously adverse developments have made their appearance to cause apprehension for the future. It is to be hoped that after the temporary influences which are now stimulating trade have worn away the demand will continue to be of large proportions. The freedom with which dealers are placing orders for spring goods for future delivery would seem to favor the belief that good business will continue. The Heavy Hardware trade shows no indications of a shrinkage in demand. All classes of merchandise handled by Heavy Hardware jobbers are moving very freely, the volume of such business being in excess of the usual conditions at this season.

St. Louis.

(By Telegraph.)

The volume of business in the Hardware market thus far in the new year seems to have borne out the expectations of the most hopeful ones in the trade, and it is a rare occurrence to find any unfavorable points in the situation. In some sections in the Southwest a little slackening in trade seems to be manifest and collections are a trifle slow. This is attributed in a large measure to uncertainty as to the growing crops, but the rain and snow of the past few days will undoubtedly eliminate this uncertainty and offset any halting tendency. Business is heavy in all lines of spring goods, with an especially active call for Steel Goods and Scythes at a firm level of prices. Shovels are moving freely, and for Hammers a good demand is to be noted, with a steffening tendency in the price-list. A possible advance in the price of Tin and Stamped Ware may result from the stimulated demand for these lines. The new prices agreed upon at the meeting last week of the larger makers of Wire Nails and Barb and Plain Wire had the desired effect of strengthening this department of the market, and prices are now on a stable basis.

NOTES ON PRICES.

Wire Nails.—Since the meeting held last week by outside manufacturers of Wire Nails the market has shown considerable strength. It is stated that the leading interest have had no occasion to meet the lowest prices which have been named, and that they are refusing to go below the minimum price of $2 per keg, f.o.b. Pittsburgh, plus actual freight to destination. While an immense business was booked for future delivery at prices recently current, many who were waiting for further declines in prices did not order before the advance. During this waiting policy on the part of some stocks have steadily been reduced, and it is thought that a considerable proportion of the stocks of Nails in the hands of merchants throughout the country are low. It is anticipated that the heavy demands which will be made on the mills and the lack of transportation facilities will delay prompt shipments considerably during the next two months. The market for carload lots is represented by the quotation of $2 to $2.05, f.o.b. Pittsburgh, plus actual freight to destination.

New York.—Local demand for Wire Nails from store is light. The market is represented by the following quotations: Small lots from store, $2.25 to $2.30; carloads on dock, $2.25.

Chicago, by Telegraph.—Jobbers have placed themselves in line with the manufacturers of Wire Nails by advancing their price on small lots to $2.25, Chicago, which makes the single carload price $2.20. The advance made by the manufacturers has not shut off business, as might have been expected, but orders are being received by them in greater volume than ever. These orders are stated to consist of moderate sized quantities, but practically all buyers are represented in the movement. The leading manufacturers report specifications for 65,000 kegs received in one day last week, calling for immediate shipment. Jobbers likewise report a very active demand from their trade.

St. Louis, by Telegraph.—Transactions in the market for Wire Nails are on a liberal basis, with a marked steadiness to be noted in prices. Small lots from store are quoted at $2.25.

Pittsburgh.—Another meeting of the Wire Nail and Wire manufacturers will be held on February 1, in Chicago. It would not be surprising if, at this meeting, another advance of $1 or $2 a ton would be made in the price of Wire Nails. It is claimed the scarcity of Steel and the high prices charged for it justify higher prices on both Nails and Wire. Demand so far this month for Wire Nails has been heavy, and it looks as though the jobbing trade were anticipating their requirements in view of an expected advance in prices. We quote Wire Nails in carloads and larger lots at $2, and small lots at $2.10 to $2.15 from store.

Cut Nails.—For the season the demand for Cut Nails is considered satisfactory. Filling of current orders about absorbs the output of the mills. General quotations are as follows, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots	$2.05
Less than carload lots	2.10

New York.—Cut Nails are in moderate demand in the local market. Representatives of mills are adhering to the price of $2.25 for Nails from store. Jobbers are asking the same price generally, but in some instances are selling 2 cents below these figures. New York quotations for carload and less than carload lots are as follows:

Carload lots on dock	$2.18
Less than carload lots on dock	2.23
From store	2.25

Chicago, by Telegraph.—The movement in Cut Nails is moderate, jobbers continuing to quote small lots at $2.30. The Chicago Steel Mfg. Company, Hammond, Ind., will shortly have their factory in operation producing Cut Nails. This factory was formerly operated by the Lakeside Nail Company.

St. Louis, by Telegraph.—The demand for Cut Nails is of a light order and prices are without change. Small lots from store are quoted from $2.30 to $2.35.

Pittsburgh.—The Cut Nail market is very strong and there is some difficulty in getting prompt deliveries of the common sizes. This is due to the fact that the mills making Cut Nails cannot get deliveries of Steel as fast as wanted. It is intimated that there may be a slight advance in price of Cut Nails when the association comes together again next week, but nothing official as regards this has been given out. We note a heavy demand for Cut Nails and the jobbing trade are buying very freely and in large lots. We quote Cut Nails at $2.05 in carload lots and $2.10 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination.

Barb Wire.—Former quotations of Barb Wire have been reaffirmed, as a result of the meeting held last

week. These, however, represent a material advance on the actual prices at which sales have been made, and the new prices are really in the nature of a substantial advance. The market is much stronger and the outlook for spring trade is excellent. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....$2.60
To jobbers in carload lots, Galvanized..... 2.90
To jobbers in less than carload lots, Painted..... 2.65
To jobbers in less than carload lots, Galvanized.... 2.95
To retailers in carload lots, Painted..... 2.70
To retailers in carload lots, Galvanized..... 3.00
To retailers in less than carload lots, Painted..... 2.80
To retailers in less than carload lots, Galvanized... 3.10

Chicago, by Telegraph.—Although the capacity for production of Barb Wire has been increased fully 25 per cent. over this time last year, the indications strongly point to another scarcity as spring approaches. Manufacturers will make strenuous efforts to prevent the scarcity from continuing as long as it did last year, but the enormous volume of business now in progress is running greatly in excess of the production. Manufacturers and dealers have practically no stocks on hand and consequently there is no reserve to draw upon. The demand for Woven Wire Fencing is also running up to large proportions. Jobbers report a very heavy trade, which is in excess of the movement at the corresponding time last year. Small lots are now quoted at $2.80 for Painted and $3.10 for Galvanized, with 5 per cent. off for carloads.

St. Louis, by Telegraph.—A large demand and inquiry prevails in the Barb Wire market and a firm tendency is apparent in the matter of prices. Jobbers quote carload lots at $2.95 for Painted and $3.25 for Galvanized.

Pittsburgh.—Demand for Barb Wire this month is much larger than for some time and the tone of the market is very strong. From present indications it is believed that spring trade this year will be larger than ever before. Prices have advanced and we quote Galvanized Barb Wire at $2.90 in carloads to jobbers and Painted at $2.60, terms 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh. These prices are probably minimum of the market, and for small lots $2 to $3 additional is charged.

Plain Wire.—The quotations of Plain Wire have been reduced 30 cents per hundred, as a result of the meeting held last week, thus bringing it nearer the actual price at which it has recently been selling. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

Base sizes.	Plain.	Galv.
To jobbers in carload lots	$1.95	$2.35
To jobbers in less than carload lots	2.00	2.40
To retailers in carload lots	2.05	2.45
To retailers in less than carload lots	2.15	2.55

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9	Base				$0.40	extra.
10	$0.05	advance	over	base	.40	"
11	.10	"	"	"	.40	"
12 and 12½	.15	"	"	"	.40	"
13	.25	"	"	"	.40	"
14	.35	"	"	"	.40	"
15	.45	"	"	"	.75	"
16	.55	"	"	"	.75	"
17	.70	"	"	"	1.00	"
18	.85	"	"	"	1.00	"

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Chicago, by Telegraph.—Manufacturers report the demand for Plain Wire fully up to the output of the mills, notwithstanding an increase in the capacity which has brought the production up considerably in excess of that of last year. Prices have been advanced, and jobbers are now quoting small lots at $2.20, base.

St. Louis, by Telegraph.—The demand and inquiry in the market for Plain Wire are referred to as very satisfactory. Jobbers quote No. 9 at $2.25 and Galvanized at $2.65, with the usual advance for other sizes.

Pittsburgh.—Demand for Plain Wire continues heavy and the outlook for spring trade is very good. Prices recently established at the Pittsburgh meeting are, we are advised, being firmly held. We quote Plain Wire at $1.90 and Galvanized at $2.35, to jobbers in carload lots, f.o.b. Pittsburgh, usual terms. To the small trade from $2 to $3 a ton higher prices are charged.

Sewer Pipe.—The Eastern and Western manufacturers of Vitrified Salt Glazed Sewer Pipe and Fittings adopted a new price-list December 19, 1901. There are several changes in the standard lists of Pipe, which are principally in the larger sizes. The lists have been adopted by all the manufacturers, we are advised, and the different makers have signified their intention of adhering to the schedule of discounts for the different territories. The list is as follows:

Price-List of Salt Glazed Sewer Pipe.

Adopted by Eastern and Western manufacturers, December 19, 1901.

Caliber of pipe.	Price per foot.	Elbows and curves 2 feet long or less, each.	Branches 1 foot and 2 feet long, each.	Branches 2½ feet long, each.	Slants per 1 foot or less, long side.	Running P. S. and single H. traps, each.	Double hand hole traps, each.	Two-piece traps, per pair.
2 inches..	$0.16	$0.50	$0.72	....	....	$1.50	....	....
3 inches..	.16	.50	.72	....	....	1.50	$1.90	....
4 inches..	.20	.65	.90	....	$0.60	2.00	2.50	....
5 inches..	.25	.85	1.13	....	.75	2.50	3.13	....
6 inches..	.30	1.10	1.35	....	.90	3.50	4.25	$3.60
8 inches..	.50	2.00	2.25	....	1.50	6.60	7.75	6.00
9 inches..	.60	2.40	2.70	....	1.80	7.50	9.00	6.60
10 inches..	.75	3.00	3.40	....	2.25	9.00	11.00	7.80
12 inches..	1.00	4.00	4.50	....	3.00	15.00	16.50	12.75
15 inches..	1.35	5.40	6.10	....	4.05	22.00	24.00	18.75
18 inches..	1.70	6.80	7.65	....	5.10	....	....	....
20 inches..	2.25	9.00	10.13	....	6.75	....	....	....
21 inches..	2.50	10.00	11.25	....	7.50	....	....	....
22 inches..	2.75	11.00	12.38	....	8.25	....	....	....
24 inches..	3.25	13.00	14.63	....	9.75	....	....	....
27 inches..	4.25	20.00	....	$21.25	...	....	....	....
30 inches..	5.50	27.50	....	27.50	...	....	....	....

Pipe of all sizes may be furnished with sockets or rings, and ring Pipe sold without rings may be sold at a discount of 10 per cent. from bill.

Increasers shall have socket on small end; Reducers, socket on large end; and shall be charged at double the price of 2 feet of Pipe, size of large end.

Each piece of Channel or Split Pipe shall be charged as three-fifths of a whole Pipe.

Stoppers or Plugs for closing Pipe, one-third of 1 foot of Pipe of the size in which it is used.

Fifty per cent. additional for Inlets 15 inches or larger on any size Pipe.

Branches 3 feet in length, add price of 2 feet of Pipe to price of 2-foot branch.

Each Inlet in addition to single branch shall be charged for at price that is added to straight Pipe for first Inlet.

SLOP AND CLOSET BOWLS, each, with or without Strainers.

12 x 6	$3.50
12 x 4	3.50
15 x 6	5.00
15 x 4	5.00

WELL TRAPS, each.

6-inch	$2.00
8-inch	3.30
9-inch	3.90
10-inch	4.70
12-inch	6.00

CELLAR TRAPS, each.

9 x 4, with bottom	$6.00	Without bottom	$5.00
12 x 4, with bottom	9.00	Without bottom	6.00

GREASE TRAPS, each.

8-inch, with bottom and cover	$6.00
10-inch, " "	7.50
12-inch, " "	10.00
15-inch, " "	15.00
18-inch, " "	20.00

BIRD CAGE WIND GUARDS, each.

6-inch	$2.50
7-inch	3.00
8-inch	3.60
10-inch	7.00
12-inch	10.00

MANDARY TOPS.

Same price as the Bird Cage Wind Guards.

WIND GUARD BONNETS, each.

5-inch	$1.40
6-inch	1.60
7-inch	2.00
8-inch	2.40

WALL COPING LIST, per foot.

8-inch and 9-inch	$0.35
12-inch and 13-inch	.55
18-inch	1.00

Corners, Angles and Closed Ends or Starters, each three times the price of 1 foot of straight Coping.

From the above list a series of discounts are made for the six different districts into which the country is divided, as follows:

DISTRICT No. 1.—New England.
DISTRICT No. 2.—New York and New Jersey.
DISTRICT No. 3.—Maryland, Delaware and District of Columbia and Pennsylvania east from a line on the eastern boundary lines of McKean, Cameron, Clearfield, Cambria and Somerset counties.

DISTRICT No. 4.—Pennsylvania west of a line on the eastern boundary line of McKean, Cameron, Clearfield, Cambria and Somerset counties, and West Virginia.
DISTRICT No. 5.—Ohio, Michigan and Kentucky.
DISTRICT No. 6.—Virginia.

The discount sheet, with other information relating to District No. 1, is as follows:

DISTRICT NO. 1.—DISCOUNTS IN EFFECT DECEMBER 19, 1901.—NEW ENGLAND.

	Per cent.
Standard Pipe, 2-inch to 24-inch	70
Double Strength, 15-inch	65
Double Strength, 18-inch, 20-inch, 24-inch	61
Standard Pipe, 27-inch and 30-inch	60
Double Strength, 27-inch and 30-inch	52

All Pipe in 2½-foot and 3-foot lengths to take 2 per cent. less discount than above, except 27-inch and larger sizes usually made in 2½-foot lengths.

Deep and wide sockets on either Standard or Double Strength Pipe to take 3 per cent. less discount than specified for the various sizes and kinds of Pipe.

Second quality Pipe, 5 per cent. greater discount than same sizes of first quality Standard Pipe.

The discount on Pipe sold for contract work, with breakage and inspection guaranteed, shall be 3 per cent. less than when sold without such guarantee.

Flue Lining, 2½ per cent. greater discount than foregoing prices on first quality Standard Pipe.

Stove Pipe and Thimbles, same discounts as first quality Standard Pipe.

Chimney Tops, 10 per cent. less discount than first quality Standard Pipe.

Wall Coping, same discount as first quality Standard Pipe.

Freight allowed on car lots, except that to points where the rate exceeds 25 cents per 100 pounds from Akron, Ohio, the price should be increased sufficiently to cover the extra cost of freight, figuring that 1 per cent. of the list equals 2 cents per 100 pounds additional freight on Standard Pipe; 2 per cent. of the list equals 3 cents per 100 pounds additional freight for Double Strength Pipe.

Breakage, if any, at risk of purchaser. Terms of payment: 60 days, or 2 per cent. off net bills after deduction of freight for cash within 15 days from date of invoice.

The remaining territory is subject to somewhat larger discounts with slight modifications in the freight allowances on car lots, varying with the district, and on Pipe sold for contract work the amount of the discount increasing as the freight rate decreases. For instance, in District No. 2, New York and New Jersey, the discount on Standard Pipe, 2 to 24 inches, is 73 per cent. In District No. 3, Maryland, &c., the same goods are subject to 75 per cent. discount, with corresponding changes in Double Strength and Standard Pipe of the various dimensions. Freight allowances, &c., also vary with the different districts.

Charles Morrill.—The following revised quotations represent the present prices on the line of Saw Sets, Bench Stops, Punches and other Hardware Specialties manufactured by Charles Morrill, 271 Broadway, New York. The prices given are subject to a discount of 50 per cent.:

	Per dozen.
Saw Sets, No. 1	$15.00
" " " 10, 11 and 95	15.63
" " " 3 and 4	20.63
" " " 5	30.00
" " " 1 Old Style	10.00
Bench Stops, No. 1	10.00
" " " 2	12.50
Punches, No. 1 (A. B. C.)	15.00
" " 2	22.50
" " 2 Metal	45.00
Bench Punch	each 30.00
Seal Presses, No. 1	20.00
" " " 2	22.50
Pearson Cyclone Spike Puller, No. 1	each 50.00

Binder Twine.—There is a general feeling evinced on the part of the larger manufacturers of Binder Twine against naming prices while the hemp market remains unsettled; and as long as manufacturers refuse to quote open prices jobbers do not feel warranted in committing themselves. A price reported to have been made by a manufacturer is on the basis of Sisal and Standard Twine at 11 cents, with Chicago or other deliveries taking the same rates of freight from the East. Other prices heard of are 10¾ and 11 cents, f.o.b. Chicago, with the usual guarantee, and a reduction of ¼ cent per pound for sales made outright without guarantee. Some jobbers and manufacturers are taking memorandum orders from their customers, indicating the quantity and kinds of Twine which will be required, also naming the time of shipment and terms of payment, prices to be named later. The general feeling among manufacturers is that prices are likely to rule high during the coming season, and 11 or 12 cents for Sisal and Standard, with a possibility of 15 cents before the season is over, is not thought unlikely by some makers. There are two factors to be taken into consideration at the present time. It is stated that there was less Twine carried over last year than for the past ten years; also that there has been less Twine made up to the present time than at the corresponding date during the past ten years. The belief is expressed that if this year's crop is equal to that of 1901, there will be a considerable shortage of Twine in some sections of the country before the season is over. There is an impression that thus far there has been comparatively little Twine sold to country dealers. It is estimated that the amount of Twine orders taken up to the present time do not represent in pounds more than 40 per cent., at the outside, of the amount of orders booked at this time in 1901. It is thought that this falling off in sales is not due to any great lack of willingness to buy on the part of dealers, but rather to the fact that manufacturers are not pushing sales this year to compare with the efforts put forth last year to secure business.

Cordage.—The feature of particular interest in the Rope market is the stiffening of Sisal Rope, as a result of higher prices for hemp. Orders are, as a rule, confined to immediate requirements, and for moderate amounts. Quotations differ with various manufacturers, as follows, on a basis of 7-16 inch and larger: Sisal Rope, 9 to 9¼ cents; Manila Rope, 12½ to 13 cents, with ¼ cent per pound rebate allowed on large quantities.

Cold Pressed Nuts.—The manufacturers of Bolts and Nuts are holding meetings this week, and at the time of going to press have not concluded their deliberations. At the meeting on Tuesday an advance of 1-10 cent per pound was made in the price of Cold Pressed Nuts.

Axes.—It is understood that negotiations with a view to making some arrangement by which the Axe market will be put in satisfactory shape are in progress, with a probability that some decision will be reached before long. The lack of harmony between the prominent manufacturers in this line has been the cause of a somewhat demoralized condition for several years, but the indications point to a better understanding and the possibility of concerted action which will put things in a greatly improved condition. Rumor has it that efforts are making to conclude a strong arrangement by which Axes, and perhaps Hatchets and Handles, will be under control. The trade will await further advices in regard to this matter, as the carrying out of plans looking to the improvement of existing conditions would probably have a marked influence on the market. At the present time this is regarded as a possibility, but not by any means assured.

Glass.—Repeated meetings of the different Glass combinations have, it is stated, failed to change the independent policy of the Independent Glass Company, recently announced by them, of selling their own product in whatever way they may deem wisest and best. The American Window Glass Company and the Federation Co-operative Association will probably work together on prices. The following statement of the situation is made by a paper devoted to Glass interests:

As matters now stand it is the Independent Glass Company, controlling 818 pots and operating about 625, against the American Window Glass Company, controlling 1518 and operating about 850, combined with the Federation Co-operative Association, controlling 1241 pots, 839 of which are operating, or a total of 1689 pots against 625. In addition to the above there are 404 pots in the country which have not connected themselves with any of the manufacturers' organizations, but 194 of these have either promised to join the co-operatives or assign their product to them to be disposed of, while the other 208 pots are prospectively counted on as likely to cast their lot with the majority combination. While there are about 2400 pots being operated, it is estimated by conservative experienced manufacturers that owing to spare pots, resulting from illness, &c., the output will not exceed that of 2000 pots steadily operated.

Definite action on the part of the American Company and the Federation Association has been deferred until the 24th inst., when they meet the Jobbers' Association. Their policy will probably be either to uphold the Glass market or to inaugurate a rate war. There is very little

local demand for Glass, every one waiting until some definite action has been taken.

Paints and Colors.—*Leads.*—A considerable quantity of White Lead in Oil is reported as being distributed by manufacturers, and the impression prevails that the demand will be large this year. Reports of concessions of ¼ cent per pound or more, according to brands, are persistent. General quotations are as follows: In lots of 500 pounds and over, 6 cents per pound; in lots of less than 500 pounds, 6½ cents per pound.

Oils.—*Linseed Oil.*—The flaxseed crop for 1901 is estimated to have been from 25,000,000 to 27,000,000 bushels, and the receipt of seed for the last week has been about double that for the corresponding week last year. The seed is being taken as fast as it reaches market, and the bulk of the crop is held either as seed or as Linseed Oil. In the face of these facts crushers are trying to force up prices of Oil, and it is possible that the price may reach 65 cents for Raw in car lots in or before February. There is little doubt that the seed market is being manipulated for the purpose of advancing Oil, and the trade will watch the Oil market with interest to see if it can be sustained at a high level through the spring. Buying is restricted to present necessities. The market is firm at about previous quotations, as follows: City Raw, 60 to 62 cents, according to quantity; out of town brands, 60 to 61 cents, according to quantity.

Spirits Turpentine.—During the week Turpentine has advanced 3 cents over last week's quotations. This has checked buying to some extent, but the local market holds firm on reports of a strong Southern market. At this point quotations, according to quantity, are as follows: Southerns, 43½ to 44 cents; machine made barrels, 44 to 44½ cents per gallon.

Letters From the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

The Plural of Tailors' Goose.

Another view of this question, to which reference has been made in our last two issues, comes from a young Hardwareman in Missouri, who writes as follows:

I see in Uncle Jake's paper, *The Iron Age*, about plural of Tailors' Goose, I think this is right:

6 Tailors' Gooses,

because it is not a live goose, if it was, geese, I think, would be proper. What is the difference between 6 Tailors' and 6 Gooses'. I am 14 years old, my home is in Indiana, I am living with Uncle Jake now in Missouri.

The following comes from a Wisconsin correspondent:

The order should read, or call for, *One-half Dozen Tailors' Geese.* For authority I refer you to Webster, where you will find Goose defined as a fowl and a tailors' iron, giving the plural of each as geese.

We are in receipt of other letters on the same subject, but their suggestions in the matter are covered by those we have already printed.

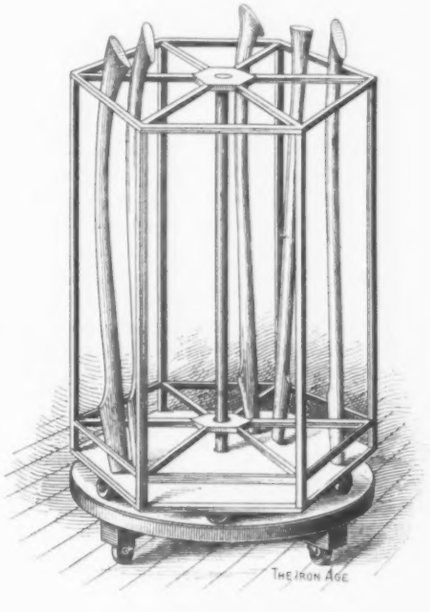
BARRETT MFG. COMPANY AND BUILDING PAPER INTERESTS.

IT is reported that the Barrett Mfg. Company, New York, Chicago and other important cities, have absorbed their strongest competitor in the West, the Union Coal Tar & Chemical Company, Chicago. Well informed Chicago authorities are of the opinion that a large sum was cleared by the latter company on the transaction. It is also rumored that options are held on the other large competing plants in this line—that is, Tarred Roofing Felts and other Coal Tar products used in roofing and paving. If these plans are carried into effect it is quite possible that a sharp advance in goods of this character may be made. Manufacturers of Red Rosin Sized Sheathing held a meeting in New York, January 21, and the presumption is that prices on this class of material will also be advanced.

A HANDY AXE HANDLE STAND.

AXE HANDLES are not the easiest articles to display, but when kept as they are by the Fox Cycle & Hardware Company, South Norwalk, Conn., whose axe handle rack is herewith illustrated, they are always on exhibition and at the same time easy to get at. This stand, which is home made, is about 37 inches high and 29 inches in diameter. It consists of two parts, the base and the revolving rack. The base is made of two joists crossed, on which a circular platform of boards is laid. Over this is laid tin plate to protect the wood from the casters of the revolving rack. From the center of the base is erected a 1¼ inch circular rod, around which the rack revolves. The base itself is mounted on four casters and can be easily moved around the store.

The revolving rack is constructed on a board base made in the form of a hexagon, each side of which measures 14½ inches. From the corners of this are erected uprights 29 inches high and 1¼ inches square. Each of these uprights is connected with its adjacent upright at the top and at a point 3 inches above the bottom by horizontal strips measuring 1 x 1½ inches. From these points 1 x 1¼ inch strips connect with the two hexagonal hubs shown in the illustration, making



A Handy Axe Handle Stand.

the rack very rigid. This rack is mounted on casters and put on the base, making the completed stand look as illustrated.

Charles F. Guyon, who for several years has made his residence in London, as the representative of the Monarch Cycle Mfg. Company, and more recently with Markt & Co., sailed on the steamer "Teutonic" for Liverpool January 15, in the interest of the export business of Alfred Field & Co., 93 Chambers street, New York, with whom he has been identified since January 1.

Several months since Hughes & Curtiss, Downer's Grove, Ill., opened a branch store at Naperville, where they are carrying a large and varied stock, embracing Heavy and Shelf Hardware, Tinware, Farming Tools and Implements, Woodenware, Paints, Oils, Wagons, Buggies, Carriages, &c.

P. P. Hubbard in the feed mill and creamery business at Prattsburg, N. Y., has lately added the sale of Agricultural Implements and Machinery.

NOTES ON FOREIGN TRADE.

BRITISH LETTER.

Offices of *The Iron Age*. HASTINGS HOUSE.
NORFOLK ST., LONDON, W. C., Jan. 11, 1902.

The British Hardware Trade in 1901.

WRITING in *The Iron Age* this time last year, I said:

> On the whole, the new year opens with all the Hardware trades in a despondent mood. The continued resistance of the Boer Republics, while stimulating the demand for war materials, has seriously curtailed or dislocated the more ordinary business transactions. In addition to this, large sums of money have been raised for charitable purposes in connection with the war, with the result that ready cash among the middle classes has gradually been growing less. The continued high price of coal has also had, during the past few months, a deadening influence not only upon trade in the producing departments, but upon domestic expenses—a very important item among the working classes. . . . By March next prices and wages will have been readjusted in practically every department of the manufacturing Hardware trade, and we shall then know more definitely what are the prospects for the new year.

Those words have been proved true by subsequent events, but they are still more true to-day. The South African war has now become a hardy annual, prices are even more dislocated than they were 12 months ago, money is more scarce among the purchasing community, the price of fuel still remains abnormally high, although it has shown reduction since the period to which I refer, but, if anything, it is relatively higher according to present prices. The home trade has declined considerably, the export trade remains about the same as the previous year, but there is one important point, and that is, notwithstanding the weakening of the English home market, our purchases of manufactured articles from abroad, particularly in Hardware and Cutlery, show a marked increase. The total value of British imports of manufactured articles amounts to no less than £93,609,754, an increase of £384,749 on the year 1900. The only conclusion to which I can come is that in Hardware and metal goods American and German competition—particularly the former—is now permanent and effective.

Hardware Bought by Great Britain.

The imported goods sold over the counter by the average Hardwareman are Baskets, Brooms, Brushes, Cutlery, Electrical Goods and Apparatus, and Hardware, Sewing Machines, Cycles, Tires and Axles may also be placed in the same category. Lumber also, hewn, sawn or split, planed or dressed, furniture goods, hard woods and veneers, are all commodities having a direct bearing upon the Hardware trade. It is not easy to analyze the sources from whence these come. For example, I do not think many Baskets come from the United States, while American Brooms and Brushes might possibly show a fair proportion of the sum total. I think that more than 50 per cent. of the Cutlery imported came from Germany, but I am tolerably sure that more than 50 per cent. of the Hardware came from the United States. However, the following imported manufactured articles may be comparatively set out:

	1900.	1901.
Cutlery	£20,696	£35,099
Electrical Goods and Apparatus	1,265,946	849,257
Hardware, other than Cutlery	880,627	1,117,360
Iron or steel manufactures:		
Girders, Beams, Joists and Pillars	705,995	828,595
Rails, Steel, for Railways or Tramways	313,212	412,829
Tires and Axles	44,089	36,176
Cycles and parts thereof, including those with Motors	194,848	176,355
Unenumerated	3,572,332	3,650,547
Machinery and mill work, or parts thereof (not Steam Engines):		
Agricultural	.....	368,832
Sewing Machines	.....	350,398
Mining	.....	46,036
Textile	.....	112,495
Other descriptions	.....	2,595,306

It will be seen that the most noticeable decrease is in Electrical Goods and Apparatus. This is due probably to the fact that electrical manufacturers in America have been busy on home demand, while upon the other hand the manufacture of Electrical Goods is greatly on the increase in this country. During the past few months we have been inundated with cheap German Electrical Goods, but there is a marked decrease notwithstanding. In the lumber trade (raw material) our imports from America rank considerably below Russia, Sweden and Canada. Three other items on the import side are worth notice. The value of bristles imported amounted to £527,664, a slight increase on 1900, but caoutchouc fell from £6,986,000 to £5,829,000. The first item shows that the British Brush trade is barely holding its own, while the importation of caoutchouc throws considerable light upon the state of the Cycle market. The third reference is that of ivory, which fell from £398,654 to £335,650. Much of this ivory, of course, goes in piano keys, but the bulk of it is for the Sheffield trades. In volume the decrease is much more marked, from 9889 to 8823 cwts. Whatever the Table Cutlery bought, therefore, we may assume to be of the cheaper qualities.

Metal Goods Sold by Great Britain.

There is an extraordinary coincidence in the value of exported Cutlery, Hardware and Implements and Tools in the final returns for this year. Thus, in 1900 the value of exported Cutlery amounted to £639,269; in 1901, £639,018. Hardware amounted in 1900 to £1,500,469; in 1901, £1,440,069. Implements and Tools in 1900, £1,491,377; in 1901, £1,491,860. In view of the increasing importance of the American Hardware export trade, the following table showing the extent of our trade with the various countries should prove pertinent:

Cutlery, to—	1900.	1901.
Russia	£2,099	£2,282
Sweden	1,186	1,011
Norway	2,334	2,177
Germany	19,304	18,057
Holland	1,828	2,305
Belgium	4,928	3,188
France	6,809	3,441
Spain and Canaries	3,242	1,989
United States	84,698	77,163
Foreign West Indies	7,252	6,627
Chile	14,547	14,446
Brazil	33,541	25,938
Argentine Republic	20,466	19,213
British South Africa	58,237	90,518
British East Indies	53,821	61,839
Australia	162,156	125,601
New Zealand		32,979
Canada	58,324	50,248
Other countries	104,497	99,996
Totals	£639,269	£639,018

Iron, unenumerated, to—		
Russia	**£58,100**	**£55,666**
Sweden	35,413	27,455
Norway	22,770	21,860
Germany	119,720	108,583
Holland	106,634	92,938
Belgium	81,865	59,870
France	39,600	22,915
Spain and Canaries	17,267	18,080
United States	43,034	44,671
Foreign West Indies	20,715	21,751
Chile	18,133	20,713
Brazil	30,090	22,155
Argentine Republic	36,431	27,122
British South Africa	121,468	146,070
British East Indies	174,912	167,422
Australia	253,827	207,570
New Zealand		67,941
Canada	28,223	22,201
Other countries	292,267	285,086
Totals	£1,500,469	£1,440,069

Galvanized Sheets, to—		
Germany	£36,461	£44,034
Holland	27,402	12,469
Portugal, Azores and Madeira	13,516	14,418
Spain and Canaries	20,745	18,065
Dutch East Indies	64,068	48,745
Philippine Islands	46,379	48,554
Foreign West Indies	39,468	36,450
Mexico	79,900	63,976
Central America	18,961	19,560
Chile	144,459	115,536
Brazil	41,427	23,737
Uruguay	39,184	42,478
Argentine Republic	321,676	321,364
British South Africa	326,315	358,353
British East Indies	674,856	586,028
Australia	1,139,898	730,952
New Zealand		125,828
Canada	62,594	113,015
British West India Islands and Guiana	30,804	31,027
Other countries	660,278	439,430
Totals	£3,788,391	£3,194,023

Tin Plates and Sheets, to—		
Russia	£431,207	£397,918
Germany	276,710	148,938
Holland	216,056	181,130
France	303,860	211,147
Portugal, Azores and Madeira	80,441	99,210
Italy	54,260	38,061
Roumania	31,514	40,116

United States	786,249	1,000,905
Brazil	74,187	45,945
Argentine Republic	73,734	50,491
British East Indies	344,725	354,659
Australia	322,670	219,490
New Zealand		32,402
Canada	338,755	245,195
Other countries	642,428	641,351
Totals	£3,976,796	£3,706,958

Birmingham and Sheffield.

The foregoing tables indicate the extent of the foreign trade. It only remains to make a few observations upon the present state of trade in Sheffield and Birmingham, the two great centers. The Cutlery trade, while not nearly as prosperous as in several previous years, has, after all, done a fair volume of business, but the prospect is far from promising, and orders are scarce. Some orders are still on the books for medium and common class goods, but the makers of high quality Cutlery have had a very quiet year. In Sheffield there is a limited number of table blade forgers, and manufacturers have found it difficult ever to accumulate stock. In the Pen and Pocket Knife departments scarcity of labor has again played a part, and many orders of many months' standing still remain unfilled. The white metal trades in Sheffield were seriously affected by the war and by the death of the Queen. Still they did a slightly larger volume of business, but at a considerably reduced price, with the result that the year must be set down as unsatisfactory. The edged Tool trade has been busy all the year, both for the home and the foreign market. I have commented on this during the last month or two, and it still remains true. In Birmingham, in the Copper working branches, the year ended badly, while Brass Goods show a decrease not only on the export trade, but also on the home trade. The increased requirements from India for Birmingham Hardware must not be overlooked by Hardware exporters in America. The Tube trade is in a perfect slough of despond, and Bedstead making has, for the present, ceased to be profitable. Lamps and Chandeliers, particularly of the better qualities, are just now a drug on the market, but machine made goods for builders' and cabinet makers' use continue to sell fairly well. Makers of Brass Taps, Cocks, Unions, Hydrants and Sanitary Fittings have been well employed, while the increased home demand for British made Electric Light Fittings I have already commented upon.

Light Castings.

During the whole year one of the trades most heavily hit has been that of light castings. Both in volume and price, the reduction is serious. This is due to two causes. In the first place, the shrinkage of domestic consumption, due mainly to the war, and, in the second place, to constant friction between employers and employed. There is no immediate prospect of a building boom, while the Australasian tariff hits light castings very hard. In addition competition in light castings is keenly felt, both from America and Germany. Add to this the fact that the price of fuel and pig iron has not declined in anything like the same ratio as to prices, and it will be obvious what a hard time the light foundry men, particularly in Southern Scotland, have experienced.

Prospects of American Trade.

One of the most significant facts that stand out in examining the details of the trade done during last year is that, notwithstanding growing depression at home, the American Hardware trade is strengthening its position over here. With more enlightened knowledge as to how to conduct business in England, and of aggressive policy in the matter of catalogues and designs, together with a cautious extension of credit, it will not be American interests that will suffer if the year upon which we have now entered should prove worse than the one that has just closed.

Ironmongery in Japan.

The Marquis Ito, ex-Prime Minister of Japan, is at present examining into affairs in this country. He will, no doubt, go back with some ideas as to trading. A correspondent to a contemporary has recently been paying a visit to the commercial museum at Tokio, and so far as the exhibits are concerned, gives the palm to Philadelphia. The only ironmongery articles which he saw are thus tabulated: "1. Some very common quality Shovels made in Osaka, Japan, for which the maker claimed that they were the cheapest in the world, the selling price being about 13 shillings per dozen (6.30 yen). 2. Two four-wheeled Perambulators of basket work, with a cushion and wooden wheels, at 3.70 yen and 4.50 yen, respectively (7 shillings 9 pence and 9 shillings 5 pence). The finish of these was very poor, but they looked fairly strong. 3. An acetylene Lamp, made in Tokio, the price of which was given at 16.50 yen (33 shillings 4 pence). I was much surprised at this, as I have not seen acetylene at work in Japan. 4. An iron "try your weight" machine, also made in Tokio, and priced at 20 yen (41 shillings 8 pence). I weighed myself, but to very little purpose, as the results were all given in Japanese. 5. A parcel of brass Locks and Hinges of very common quality, also made in Tokio, and bearing a Japanese label only. There were two foreign Hardware exhibits—namely, a good display of Hollow Ware made by Hermann Wuppermann of Pinneburg, Holstein, Germany, and a petroleum engine, priced at 1350 yen (£136), made by Metz & Weiss of New York, and shown by Andrews & George of Yokohoma."

The Metal Trades and Unionism.

The inquiry which the *Times* is making into the operations of trade unionism will probably have a result quite different from that anticipated. The writer starts out to prove that the crisis in British industry is due to the policy of "Ca 'canny," or go-easy, adopted by the workmen. But when we examine his charges in detail, it becomes evident that just as much censure is to be attached to the British manufacturer, who is as hopelessly wedded to obsolete methods as the workmen are to their more or less short sighted policy of higgling in the market for the highest price for their labor. I quote the following to illustrate what I mean, and to show the kind of industry which American makers have to compete with. As both tin plate goods and "hurricane" Lamps are made in America in considerable quantities, American manufacturers should learn something from this little thumb nail sketch of how the Birmingham manufacturers conduct their works:

One of the directions in which such economy was found possible was in the supplementing of male by female labor. There were certain stages in the production of tin plate goods which could be managed quite as well by women as by men, and the difference in the wages made this fact an important consideration to the manufacturer. Thus, men were employed to set the presses, but women were put on to do the press work, and they showed in it a dexterity which no male worker could surpass. But the manufacturers also found that women could do the soldering as well, and that they did it with a degree of neatness to which comparatively few of the men could attain. Women were also put on to do the riveting; but there were other stages where male labor was thought desirable. It is, however, one of the hard and fast rules of the Tin Plate Workers' Association that work begun by either men or women should be completed by them, without any passing from the one to the other. The association is also keen on the subject of limiting the number of boys and under hands employed. A characteristic illustration of its action is afforded by what it once did in the case of a Midland firm who produce every year 500 gross of "hurricane" Lanterns, of the type used by the natives of India. At that time the firm in question employed both men and women on the work, according to the different stages; but the union officials came down upon them with a declaration that certain processes which the women were doing were men's work, and should be left to them; and they made a further demand that the firm should employ only one boy to every four men, instead of two to every four. It so happened that German competition in the making of this particular Lantern was very keen, and the firm represented to the union officials that to concede their demands would greatly increase the cost of production, so that there would be no margin left for profit. In the end the firm cut themselves free from trade union interference by giving notice to the whole of their union hands, taking back, however, those who were willing to work according to the wishes of their employers. Meantime the firm had made the discovery that women were quite competent to turn out the Lantern in question themselves, without any need whatever to resort to the assistance of men. As the women get 14 or 15 shillings a week, in place of the 35 to 40 shillings per week given to the men, and as they turn out

the Lanterns almost as quickly as the men, and, in some respects, do their work even better, the result to the firm has been distinctly beneficial, while the outcome of the trade union interference has been distinctly detrimental to the welfare of the unionists themselves.

Notwithstanding such oldfashioned methods indicated in the foregoing, it is surely a curious phenomenon that British manufacturers are so slow in associating among themselves to discuss trade conditions and ascertain how best they are to attain to greater efficiency.

The Australasian Tariff.

During the last week I have been among a number of buyers for Australia. I find they are unanimous in the belief that the present provisional tariff is unworkable and inequitable. Some of them even expect important changes to be announced before the new month is out.

AMERICAN AGRICULTURAL IMPLEMENTS IN SOUTHERN RUSSIA.

THE magnitude of the business in Agricultural Implements of American manufacture, annually sent to Black Sea ports, in Southern Russia, is shown by the volume of shipments now going forward, in a series of steamers carrying nothing else. The Wilson Line will dispatch the steamer "Othello," carrying 10,000 tons, cubic measurement, from Philadelphia direct to Novorossisk, January 23-25; the steamer "Alecto," from Philadelphia, carrying 6500 tons measurement, for Novorossisk and Odessa, will follow about February 5; the steamer "Castello" will be the next in order, from New York about February 12, for Novorossisk and Odessa, carrying 6000 tons. These vessels have been chartered expressly to carry the season's orders for Agricultural Implements manufactured principally by the McCormick Harvesting Machine Company, Chicago; Deering Harvester Company, Chicago; D. M. Osborne & Co., Auburn, N. Y., Adriance, Platt & Co., Poughkeepsie, N. Y., and the Massey-Harris Company, Toronto, Canada. About March 5 a fourth steamer will be sent with a cargo of the same character to the same section. Last year three steamers were dispatched, loaded exclusively with Agricultural Implements; this year's business requiring four steamers, as noted above. Much similar material goes to the same market by the regular Wilson Line, which is transhipped at Hull, England, but the steamers named take the larger orders.

PARCELS POST CONVENTION WITH BOLIVIA.

A NEW ORDER has been issued by the Post Office Department relative to the parcels post service between the United States and Bolivia, which is similar in character to that now in existence between this country and Chili. The regulations provide that on and after February 1, parcels post packages mailed in Bolivia and addressed for delivery in the United States, or mailed in the United States for delivery in Bolivia, will be admitted to the mails between the two countries. The order provides that the parcel must not weigh more than 11 pounds or be more than 3 feet 6 inches by 6 feet in size. Postage on such articles must be prepaid at the rate of 20 cents per pound. A charge of 5 cents will be levied for delivery on all packages coming from Bolivia. Parcels for delivery in Bolivia will be included in the mails made up in New York and San Francisco, the points of departure in the United States. Mail of this character goes direct to La Paz for redistribution in Bolivia.

ANOTHER STEAMSHIP SERVICE TO THE LEVANT.

THE pioneer steamer "Seriphos" of the Levant Line has sailed from Hamburg for New York, and will be the initial boat of the new Levant service from New York to Eastern Mediterranean ports. This line will be operated jointly by the Hamburg-American line, 37 Broadway, New York, and Funch, Edye & Co., Produce Exchange, New York. The present schedule of ships and sailings is as follows: "Seriphos" February 6, "Sicilia" February 27, "Georgia" March 20, "Milos" April 17, which will be about the interval of departure until July 1, when it is the intention to dispatch a steamer twice a month. This will afford a direct service for Malta, Alexandria, Constantinople, Odessa and Novorossisk, with the privilege of calling at other ports. Through bills of lading will be issued to Patras, Piræus, Smyrna, Syra, Salonica, Beirut, Jaffa, Alexandretta, Galatz, Braila, Taganrog, and all points in the Mediterranean east of Malta; the Danube and the Black Sea. This is another unmistakable indication of the growth of American trade in those markets, as the representatives of this line are among the largest vessel owners in the carrying trade of the world, and is an expression of their opinion of the future of this trade, as we already have good communication with that section.

HARDWARE INTERESTS IN THE HAWAIIAN ISLANDS.

ADVICES indicate that the Hardware interests of the Hawaiian Islands have materially increased during the past two or three years. A number of new stores have been opened, although the increase has not been so great as would have been the case had not the country been visited by a siege of the Black Plague for nearly six months during the first half of 1900. The large wholesalers have been warranted in carrying much larger stocks than in the past, on account of the increased consumption caused by the enlarging of some of the plantations and by the promotion of some very large ones. This impetus in the plantation business was actuated by the union with the United States and the assurance that Hawaiian sugars would have the protection of the American tariff.

The Typical Hardware Store.

The typical Hardware store of the islands consists usually of a fair sized building, in which there are ample opportunities for establishing various repair outfits, furnaces for melting metals and apparatus for doing very much work which in America and other countries would be considered as not being a part of the Hardware merchants' business. Honolulu merchants are very enterprising and aggressive. The interior of the store is fitted with rows of shelves that extend in many instances completely around the store. These shelves are fitted with drawers and boxes in such a way that an assortment of Screws, Nails, Bolts, Hinges and kindred articles can be placed in them in liberal lots. On the front of each drawer or box a sample of the article contained therein, pretty much like the American idea. The price of the article is marked in plain figures, and the cost price in private characters. The counters are arranged very similar to the American idea, except that all sorts of stands, cases and advertising devices are arranged on them, very many of which are in the way. You have to push about through exhibiting stands and the like in order to get a glimpse of one of the clerks. The furnishings of the best stores are in hard wood, stained to harmonize with surroundings. There is considerable brass and nickel work used in ornamenting the interior of the high-class store, and some of the designs which are wrought out in this way are exceedingly attractive. The clerks have good taste in arranging the articles, and as a rule the customer can get waited upon promptly.

Store of E. O. Hall & Son.

In this connection it may be said that compared with a great many stores in many of the larger cities of the United States in none were there signs of greater effort to facilitate the handling of goods and at the same time have a fine display than was to be seen in the Hall Building, destroyed by fire last summer. In this case neither time nor money was spared to have as beautiful a store as might be seen anywhere in the United States. It may be added there are other fine establishments in Honolulu.

Hardware Clerk Quality.

There are two classes of Hardware clerks in the islands; the first of which may be classed as the American, who have come with a view to seeking better returns for

their labors, or who have come with the idea of some time engaging in the business themselves.

The second class are the native clerks, who are very polite and accommodating, as a rule, having been trained by the Americans and other foreigners, for there are very many Americans and Europeans in Honolulu and other ports of the island; in fact, one would suppose that some of the districts were American colonies. The stores in Honolulu and the vicinity are well equipped with capable forces of clerks, about 70 per cent. of whom appeared to be natives, and about 15 per cent. Americans, and the balance sons of European countries. Of the first class, taking the large and representative establishment of E. O. Hall & Son as an example, the help is of the best that money can get, as warranted by their trade. Clerks in this category receive from $75 to $150 per month. Of the second class, employees fill such positions as shipping clerks, warehouse men, packing clerks and kindred places. All in all, the help employed in Honolulu stores are an industrious lot of men. What Honolulu is short of is errand boys. By virtue of the prosperity with which the islands have been blessed most all of the children in all of the different classes are compelled to pursue their studies until they arrive at a mature age, thus leaving employers there in need of the many office and errand boys and such help with which the cities in the States are blessed.

Even Character of the Climate.

The climate is of a very even nature, and it is never any hotter at precise noon than it is several hours either side of it. Hardware stores, generally speaking, open at 6.30 a.m., and close at 5 p.m. None of the stores open in the evening. On Saturday a half day is observed by most all of the large dealers.

Paints, Colors and Varnishes.

The selling value of these goods is considerably higher in the tropics than in the northern countries, because it is difficult to keep certain of the Paints, and liberal profits have to be made in order to bring the dealer out whole. The demand for Colors and Varnishes has increased perceptibly in recent years. There was a time when many of the people lived in houses which required no coloring materials. Others occupied residences of stone, or lived in large buildings which were never painted, but which were gone over with white substances every year; this material being secured by grinding the white shells of the beach, and mixing them with some native Varnishes manufactured from the gums of the trees. Thus one would visit a section and find every house pure white, the sun beating upon it producing a blinding glaze. Now Colors of all sorts are in request, and with the Colors there must, of course, be outfits of mixing devices, Brushes and Glaziers' Tools.

The Primitive Window Superseded.

Many of the buildings which for years have been supplied with white transparent sea shells in frame work for windows, have been altered in such a way as to utilize the better and more modern forms of glass windows. The transparent shells let in the light, but you cannot see through from the inside to the outside and distinguish objects. The windows must be open to see out, therefore the popularity of the shell window is disappearing, and glass windows are being put in their place. This calls for many supplies in the glazing line. Every Hardware store is carrying Glass and Glazing Tools, and all equipments necessary for the glazier, and the profits are liberal.

The Plantation System

The system of plantations is an important feature of the Hawaiian Islands. Although most all of the plantations are controlled by persons making their homes in Honolulu, the plantations are in no way tied down to the payment of toll to Honolulu.

Importations for Five and One-half Months.

Of the importations of Hawaii for five and a half months during 1900, amounting to $10,231,197.58, there was $7,741,734.83 entered at the port of Honolulu, and the balance at ports in the other islands. Since the period mentioned the proportion of importations going direct to the other islands has greatly increased. This may be attributed to the other islands having to fall back entirely on their own resources during the long quarantine period, when Hawaii was shut off from the outside ports. Since this period Hilo, on the island of Hawaii, and Kahului, on the island of Maui, besides several other ports, have been importing large quantities of merchandise direct. In quoting the above figures it must be said that the amount is not all for Hardware, but the figures will show the proportion of trade going to Honolulu. Of the amount mentioned $1,501,601.23 was for machinery.

Branches of Honolulu Houses in Other Ports.

Many of the large wholesale houses of Honolulu have branch stores in several of the other ports of entry outside of Honolulu. To afford a conception of what may be called a Hardware store in Honolulu it may be said that the sales of one of the larger concerns for the year ending December 31, 1900, were $429,000 approximately.

Some Manufacturing in Connection With Hardware Stores.

In the Hardware stores manufacturing industries of more or less primitive character are carried on, also several of them have Bicycle departments, in connection with which repair shops are conducted. One concern dispose of 100 wheels each month, and in the erection of these wheels alone it is necessary to maintain quite a large force of help. In the repair shop, which is well equipped with lathes, &c., a considerable repairing business is done. The average store would give the casual observer an idea that the establishments there carry almost everything from A to Z. As a matter of fact the lines carried under the head of Hardware are very general, and include everything in iron and steel that can be used on the plantations, as well as Paints and Oils, and any such supplies as are consumed on the plantations, aside from food stuffs and dry goods.

Diversity of Goods Carried

The opinion has been expressed that the average merchant endeavors to cover too much ground, which to some extent is true, but when it is remembered that a store has a single customer, like a plantation employing 1000 or more men and women, this customer cannot be accommodated to the best advantage except by carrying everything possible that might be called Hardware. The variety of the lines Honolulu merchants deal in is not very much dissimilar to those carried by the large wholesale houses of San Francisco.

Manufacturing Interests of Honolulu.

Of the manufacturing interests of Honolulu there is much reason to be proud. For instance, the Honolulu Iron Works are one the largest plants west of the Mississippi. From this enormous plant is turned out the heaviest of plantation machinery in competition with the foundries of the States. This plant is fitted with all of the modern appliances, including electric cranes, &c. The islands are wholly dependent upon themselves for repairs to the machinery used on the plantations, and when it is considered that they have some of the largest pumping plants and sugar mills in the world, there is some basis for self congratulation.

RUSSELL & ERWIN MFG. COMPANY.

RUSSELL & ERWIN MFG. COMPANY, New Britain, Conn., and 43-47 Chambers street, New York, have issued a revised edition of their No. 4 price-list, in which is included appendix A, covering goods added to their lines between November 1, 1900, and October 1, 1901. They also have for distribution extra pages for insertion in the 1899 catalogue, illustrating and describing the various additions. The representation of their extensive line and present prices is made very complete, and a form that will serve the convenience of the trade.

Barbour Hardware Company, dealers in Hardware, Stoves, Furnaces, &c., East St. Louis, Ill., have increased their capital stock to $20,000.

Hardware Organizations.

Missouri Retail Stove and Hardware Dealers' Association.

The annual meeting of the Missouri Retail Stove and Hardware Dealers' Association will be held in St. Louis February 18 and 19. The Lindell Hotel has been selected as the convention headquarters, while the business meetings will be held in the Mercantile Club rooms, at the corner of Seventh and Locust streets. A fare of one and one-third for the round trip has been granted by the railroads, but in order to secure this rate the delegates and others attending the convention must obtain receipt from ticket agent at point where ticket is purchased. The St. Louis Committee on Arrangements is composed of F. A. Kansteiner, August Steinmeier and G. A. Pauley. The convention is expected to be the largest ever held by the association.

The meeting will be called to order at 10 o'clock on the morning of the 18th, when the president will make his annual address. This will be followed by the secretary's report, and the session will be brought to a close by a paper by Taylor Frier of Louisiana, Mo., who will have for his subject "Association Loyalty." The afternoon session will open at 2 o'clock, the first number on the programme being an address by M. L. Corey of Argos, Ind., secretary of the National Retail Hardware Dealers' Association. Mr. Corey will be followed by H. F. Wright, Lebanon, Mo., who will read a paper entitled "Are Retailers Adjusting Their Methods to Twentieth Century Conditions?" and by Aug. Steinmeier, St. Louis, who will discuss the topic, "Is Co-operative Buying Practical?" Attention will then be given to the contents of the Question Box. The morning session of the second day will be inaugurated with a paper by Louis Hering of Blackburn, who will discuss "Store Character, or the Value of a Business Reputation." He will be followed by R. W. Shapleigh of the Norvell-Shapleigh Hardware Company of St. Louis, who will make an address. The features of the closing session in the afternoon will be a general discussion of the subject of "Co-operative Insurance," and a paper by William Kansteiner of Hannibal on "The Evolution of the Hardware Business, 1850-1901." Frederick Neudorff, St. Joseph, is the secretary of the association.

Michigan Retail Hardware Dealers' Association.

A meeting of the Executive Committee of the Michigan Retail Hardware Dealers' Association was held at the Hotel Cadillac, Detroit, on the 13th inst. The following members were present: President H. C. Minnie, Messrs. Potter of Alpena, Popp of Saginaw, Pipp of Otsego, Scott of Marine City, Harsha of Delray, and Treasurer H. C. Weber and the secretary. After an informal discussion as to the place of holding the next meeting it was unanimously decided to hold it in Detroit, August 13 and 14, at the Hotel Cadillac.

Various plans for increasing the membership were discussed and it was finally, on motion of Mr. Weber, decided to make a general offer of $1 cash for each new member obtained, the following special prizes being offered for those obtaining the largest list:

First.—A prize of $25, open to all who turn in 12 or more members, to be awarded to the one securing the highest number. Contestants for the $25 prize are barred from participating in either the $15 or $10 prizes.

Second.—A prize of $15, open to all who secure eight or more new members, to be awarded to the one securing the highest number. Contestants for the $15 prize are not allowed to participate in the $10 prize.

Third.—A prize of $10, open to all who secure five or more new members, to be awarded to the one securing the highest number.

On motion the president was instructed to appoint a committee who should have charge of the programme for the August convention and who should act in conjunction with the president and the assistant secretary. President Minnie appointed Messrs. Weber, Popp and Scott as members of that committee.

On motion the secretary was instructed to send to all members a list of the proceedings of this meeting, with that section of the by-laws relating to membership, in which he was to call especial attention to the prizes and awards for securing new members. He was also instructed to send a letter to the various Hardware traveling men in Michigan calling their attention to these awards and urging them to co-operate in securing new members.

Secretary Fred. H. Cozzens, being now engaged in the wholesale Hardware business in New York, stated that he could not equitably longer maintain his relations with the organization, and he therefore tendered his resignation, to take immediate effect, which was accepted after a resolution of thanks and appreciation had been unanimously passed. A further resolution, voting the sum of $100 in further recognition of his services in behalf of the retail Hardware trade, was also unanimously passed.

A resolution was also unanimously passed stating that it was the sense that the sales of Builders' Hardware to the consumer by the jobbers of Michigan were becoming altogether too frequent, and expressing it as the unanimous sense of the meeting that wherever such sales are made by jobber a proper commission on credit shall be given a retail dealer who does business within the normal selling district where the sale takes place. The secretary was requested to send a copy of these resolutions to all jobbers in Michigan and to request their co-operation in having it enforced.

H. C. Weber was elected secretary to fill the unexpired term of Mr. Cozzens, with authority to appoint an assistant secretary, which he at once did, appointing Clarence A. Day, assistant treasurer of the Trade Journal Association, in such capacity.

Iowa Retail Hardware Dealers' Association.

The fourth annual meeting of the Iowa Retail Hardware Dealers' Association will be held at Des Moines on February 18, 19 and 20, headquarters being at the Savery Hotel. An interesting programme has been prepared and every effort will be made by those in official charge to make the three days' gathering one of profit and pleasure. A number of papers are down on the programme, among them the following: "Benefits of Organization," by ex-President H. A. Cole, Council Bluffs, and C. R. Keating, Mt. Ayr; "Credits," by S. R. Miles, Mason City; "The Relation of Jobber and Retail Dealer," by C. F. Schmidt, Marshalltown; "Trusts in Their Relation to the Retail Dealer," by Geo. Staehle, Earlville, and "Our Competitors," by L. Lindenburg, Dubuque. There will be a Question Box as usual for the purpose of bringing up Hardware matters on which the views of those in attendance are solicited. The secretary of this association is W. H. Keating, Ottumwa, who will cheerfully furnish any information desired in regard to the coming meeting.

Retail Hardware Association in New York State—Who Will Start It?

Several suggestions have been made from time to time looking to the organization of a retail Hardware dealers' association in New York State, but thus far nothing has been done. The matter is broached again in the following letter from a merchant located in a town in the central part of the State:

> Can there not be some effort made during the winter months to organize the dealers in this State? It seems to me we are making a mistake in not giving more attention to this matter.
>
> We fully agree with a recent correspondent who said he believed it was a great advantage to any dealer to meet others engaged in the same business and exchange ideas and compare methods. None of us are yet too old to learn.

It is generally conceded that much may be accomplished for the welfare of the trade through a State association. This is indicated in the success which has attended those which have been formed during recent years in the West. That there is a good field for an association in New York, and that there are evils and

abuses connected with the Hardware business which call for correction, is freely admitted. The jobbers in the State have been organized for years and have a strong association, which is understood to have yielded splendid results. The sister State of Pennsylvania is getting its Hardware merchants into line. The trade are apparently waiting for some public spirited and enterprising merchant to take the matter up and give a little of his time to the launching of an association, calling a meeting at some accessible point, where the nucleus of an organization may be developed.

THE LATE MARCELLUS HARTLEY.

AT a special meeting of the Gun and Sporting Goods trade, held January 10, the following minute was adopted:

In obedience to the Omnipotent decree, in a moment, as in the "twinkling of an eye," Marcellus Hartley has been called from us.

His name has been associated with all our business undertakings. For many years he has stood forth clearly as the leading figure in the trade, to which nearly all his life was devoted, and from which the many varied enterprises that sought his counsel in later years were not able to weaken his allegiance.

His indomitable will, ceaseless energy and untiring perseverance make a standard to which few can attain.

His integrity of character, faithfulness of purpose, largeness of view and keenness of discernment made him more and more sought as a leader and adviser.

Until the last moment of life he was a man of affairs.

In recognition of his worth we desire to record this tribute of honor, regard and esteem.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

Elmer Hardware Company's store, at Roulette, Pa., was burned out on the 5th inst., and all their catalogues and price-lists destroyed. They will be pleased to hear from manufacturers in their line with copies of their latest trade literature.

Bayside Mercantile Company, Bayside, Borough of Queens, New York City, will value catalogues, price-lists and quotations relating to Hardware, Oils, Paints, House Furnishings, &c.

Swinton & Co., Port Jervis, N. Y., request catalogues, price-lists, &c., relating to novelties in Hardware Specialties, Wooden Ware and House Furnishing Goods.

CALENDARS, &c.

SHANNAHAN & WRIGHTSON HARDWARE COMPANY, Easton, Md., dealers in Hardware, Agricultural Implements, Machinery, &c.

THE W. P. MASSUERE COMPANY, dealers in Hardware, Farming Implements, &c., Arcadia, Wis., issue a calendar in which portraits are given of the officers of the company and of their employees.

J. D. WARREN MFG. COMPANY, Masonic Temple, Chicago: Wall calendar, having for its center piece an interior view of a Hardware store, fitted with Warren's Sectional Cabinet Fixtures. This view has a setting of chocolate colored background with the lettering in white. The arrangement is unique and attractive.

PETERS CARTRIDGE COMPANY, Cincinnati, Ohio, and 80 Chambers street, New York: Hanging calendar illustrating various articles of their product.

THE JENNISON HARDWARE COMPANY, Bay City, Mich., an attractive memorandum book bound in leather and celluloid, in which some useful tables, &c., are also given.

E. C. ATKINS & CO.'S NEW CATALOGUE.

E. C. ATKINS & CO., Indianapolis, Ind., and 64 Reade street, New York, have just issued a fine complete catalogue, known as the Hardware Edition, of their Saws, Saw Tools and Mill Specialties. Particular attention is called to additions and changes in their line of Cross Cut Saws, also small goods, as Hand Saws, &c. Features of the catalogue are views of their works and branch houses, medals, registered trade-marks and telegraph code. On a separate sheet is a printed list of new goods added, changes in prices and other information for the convenience of the trade.

TRADE ITEMS.

A. KLEIN, 453-455 Broome street, New York, agent in the United States for European manufacturers, and importer of high and medium grade polished Austrian Steel Key Rings, German Nickel Zinc and the Universal Bicycle Pump Attachment, has removed to 115 Worth street, between Broadway and Elm street.

E. I. HORSMAN, 380-382 Broadway, New York, has removed to 354 Broadway, corner of Leonard street. This house manufacture Lawn Tennis, Croquet, Games, Scientific Kites and goods for various other sports, both indoor and outdoor amusements. They are also importers and manufacturers' agents in Toys, Games, Dolls, Doll Outfits and similar lines of goods.

CORNELIUS KAHLEN, 536-538 Pearl street, New York, is the representative for the United States and Canada of Louis Schopper, Leipzig, Germany, manufacturer of a large line of sensitive apparatus and instruments of precision, shown in an illustrated catalogue of 65 pages. Some of the goods described are standard and pocket Micrometer Gauges, various kinds of delicate Scales for weighing paper for laboratory use, &c., Testers for determining the strength of textiles, paper, &c., Hygrometers, Microscopes and other high grade mechanical devices of similar character.

FORSTER PULLEY WORKS, Fairport, N. Y., manufacturers of the Forster Natural Finish Wood Split Pulleys, have appointed Alder & Boyd, 37 Warren street, New York, sales agents for New York and the export trade. A complete stock is carried in New York.

THE PENNSYLVANIA ELECTRIC COMPANY, successors to the Marietta Mfg. Company, Marietta, Pa., have recently established their New York office with Alder & Boyd, 37 Warren street, who will represent them in New York and among the export trade. The company have issued a new catalogue of the products of their blower and forge department, illustrating and describing a large line of Blowers, Forges, Tire Benders, &c., including a number of additions since the publication of their last catalogue. Many numbers and list prices have been changed.

WILLIAM W. MATTHIAS, for a number of years traveler for the Eagle File Company, Middletown, N. Y., and last year sales manager of the J. Barton Smith Company, Philadelphia, has been appointed assistant manager of the factories of the New York Knife Company, at Walden, N. Y., to date from January 1.

F. J. MATTISON, 105 Chambers street, New York, long in the employ of the Fred. J. Meyers Mfg. Company, Hamilton, Ohio, as their New York representative, severed that connection January 1, 1902. Mr. Mattison will continue in business at the above address and handle a full line of Conductors' and Ticket Punches as heretofore. He has made connections with the different manufacturers of similar lines of goods to handle their product in New York and elsewhere. He also has the agency for the Roll Check Company, 9 Murray street, New York, manufacturers of Patent Checks for use in restaurants.

A. W. Payne has succeeded Payne Bros. in the Hardware, Stove and Sporting Goods business in North Salem, Mo.

THE LANG CUTLERY WORKS.

THE LANG CUTLERY WORKS have just established a factory at 240 to 246 West Lake street, Chicago, for the manufacture of Shears. They have completed the installation of their machinery and begun to place their product on the market. The equipment comprises all the facilities necessary for the operation of a Shear factory of the most modern character. About 30 processes are required for the production of a finished pair of Shears from the raw steel. The president of the company is B. B. Lang, who has had long experience in the Cutlery trade, and for seven years was the Shear expert of the Simmons Hardware Company, St. Louis, and during that time traveled between the Ohio River and the Pacific Coast, representing this special branch of their business. He was subsequently president of the Lang Cutlery Works, now the Iowa Cutlery Works, of Cedar Rapids, Iowa. This establishment was placed on a successful basis and Mr. Lang recently sold out his interest and removed to Chicago. The new factory will manufacture a full line of Shears of the highest possible grade, in both oval and flat patterns, using the best materials and employing the most skillful workmen. They will make a specialty of Lang's new Right and Left Hand Thread Bolt Shears. These Shears are so named from the bolt holding the blades, which has a right hand thread on the part running through the blades and a left-hand thread on the part which projects beyond the blades to receive the bolt. In this way the loosening of the bolt is guarded against. The oval pattern, being all curves, is considered by them as much more handsome than the square pattern. The company, however, manufacture both oval and flat shapes, the line made embracing all lengths of Shears, straight and bent, including Bankers' and Barbers' Shears.

M. S. BENEDICT MFG. COMPANY.

ANNOUNCEMENT is made under date of the 1st inst. by M. S. Benedict Mfg. Company, Hamilton Mfg. Company, Benedict-Clarke Silver Company and Benedict-Dunn Company of the consolidation and incorporation, with a capital of $600,000, of their several plants, under the name of M. S. Benedict Mfg. Company, with general offices at East Syracuse, N. Y., branches at 109 and 111 Wabash avenue, Chicago; 409 Broadway, New York, and 50 Bay street, Toronto, Ont., and factories at East Syracuse, N. Y., and Ottawa, Ill. It is stated that the high character of their wares will be maintained in their several lines, each of which will be shown and presented by the same salesmen as heretofore. The following are the officers of the new company: M. Stuart Benedict, president; E. H. Banker, first vice-president; John D. Allan, second vice-president, and Harry L. Benedict, secretary and treasurer.

WHITE, VAN GLAHN & CO.'S CATALOGUE.

THE 1902 illustrated trade catalogue and price-list of Hardware and Tools of White, Van Glahn & Co., 15, 16 and 17 Chatham square, and 49 East Forty-second street, New York, has just been issued in the form of an attractive book of 320 pages bound in red cloth. In the front are given pictures of the old store in Chatham square and of the new branch store in Forty-second street. The catalogue is fully illustrated, the cuts being of good quality, but of small size, thus enabling a very large line to be shown in the book. Net prices are quoted throughout by the dozen, and for single articles, except on such lines as Screws, Bolts, &c., where the standard list prices are given with the intimation that discounts will be quoted on application. Scattered throughout the book are tables and other useful information. The volume is attractively gotten up, both in typographical display and in arrangement of matter.

Norelius & Co., El Campo. Texas, have disposed of their Hardware and lumber business to Mack Webb, who will continue at the old stand.

CONTENTS.

	PAGE.
A New Machine for Ore Unloading. Illustrated	1
The Cedar Point Furnace	2
Central Pennsylvania News	2
Shipbuilding on the Lakes	3
The Sellers 28-Foot Boring and Turning Mill. Illustrated	4
The Coke Situation at Chicago	5
The Eight-Hour Law in Government Work	5
The Inland Steel Plant	5
The Manufacture of Locking Bar Pipes in Western Australia. Illustrated	6
Canadian News	8
Larger Sheet Metal Working Machines	9
The Lindsay Reversing Gear for Rolling Mills. Illustrated	10
The Lake Superior Ore Region	12
The Department of Commerce	13
The Wire Rod Record	13
Americans Push Work in England	14
The Belfont Iron Works	14
New Pittsburgh Lathe and Boring Machine. Illustrated	14
Illinois Coke Developments	15
The Juniata Tin Plate Company	15
A New Steel Plant at Joliet	15
Lake Mining Matters	16
Notable Work in Reconstructing Compound Engines	17
Large Fan for Mechanical Draft. Illustrated	17
The Ship Subsidy Bill	18
The Morgan Coil Threading Machine. Illustrated	19
A Celebration at Pencoyd	20
The Brown Platinum Pyrometer Patent	21
The Fluctuations in the Prices of Iron and Steel. (With Supplement)	22
The New Springfield Machinery Plant at Bridgeport	22
The Witzenmann Metal Hose. Illustrated	22
Press for Copper Banding Shells. Illustrated	23
Notes from Great Britain	24
A New Expansion Bolt for Electrical Work. Illustrated	26
Shenango Valley Notes	26
Editorials:	
Wireless Telegraphy	27
The Contraction of Bank Circulation	27
The Barometer of the Iron Trade	28
Schaffer on Strikes	28
Obituary	28
A New Galvanizing and Tinning Plant	28
Central American News	29
New Tin Plate Mill at McKeesport	29
The Isabella Furnaces	29
New Blast Furnace at Sharpsville	29
The Columbia Bridge Company	29
United Wire & Supply Company	29
The Cresswell & Waters Company	29
A New Bessemer Record	29
The Troy Steel Plant	29
Personal	30
The Power Plant for the St. Louis World's Fair	30
Consular Reform	30
Manufacturing:	
Iron and Steel	31
General Machinery	31
Boilers, Engines and Accessories	31
Foundries	32
Bridges and Buildings	32
Fires	32
Hardware	32
Miscellaneous	33
A New Town Near Pittsburgh	33
The Iron and Metal Trades:	
Comparison of Prices	34
Philadelphia	36
Cincinnati	37
Cleveland	37
St. Louis	38
Pittsburgh	38
New York	39
Metal Market	40
The Philadelphia Machinery Market	41
The New York Machinery Market	42
The American Tube & Stamping Company	45
Iron and Industrial Stocks	45
A Proposed English Steel Consolidation	46
Baldwin Automobile Mfg. Company	46
The Pressed Steel Car Company	46
Hardware:	
Condition of Trade	47
Notes on Prices	48
Letters from the Trade	51
Barrett Mfg. Company and Building Paper Interests	51
A Handy Axe Handle Stand. Illustrated	51
Notes on Foreign Trade	52
American Agricultural Implements in Southern Russia	54
Parcels Post Convention with Bolivia	54
Another Steamship Service to the Levant	54
Hardware Interests in the Hawaiian Islands	54
Russell & Erwin Mfg. Company	55
Hardware Organizations:	
Missouri Retail Stove and Hardware Dealers' Association	56
Michigan Retail Hardware Dealers' Association	56
Iowa Retail Hardware Dealers' Association	56
Retail Hardware Association in New York State—Who Will Start It?	56
The Late Marcellus Hartley	57
Requests for Catalogues, &c	57
Calendars, &c	57
E. C. Atkins & Co.'s New Catalogue	57
Trade Items	57
The Lang Cutlery Works	58
M. S. Benedict Mfg. Company	58
White, Van Glahn & Co.'s Catalogue	58
Show Window Display. Illustrated	59
Piano Harvesting Machinery	61
A. L. Eccles Company	61
Price-Lists, Circulars, &c	61
Miscellaneous Notes:	
Crescent Razor Stropper	62
Ideal Series of .25-Caliber Bullets No. 257,231. Illus.	62
Iron Age Combined Single Wheel Hoe Hill and Drill Seeder No. 15. Illustrated	62
Automatic Micrometer Thickness Gauge. Illustrated	62
Current Hardware Prices	63
Current Metal Prices	70

SHOW WINDOW DISPLAY.

The trade are invited to contribute information in regard to methods which have proved satisfactory, with descriptions of attractive displays. Inquiries also are solicited, to which careful attention will be given.

HARDWARE STORE WINDOW DISPLAY.

BY ALBERT B. GUENTHER.

It may be said that fully 25 per cent. of Hardware merchants do not appreciate the advertising value of their show windows. They seldom make use of them and seldom advertise. It may be added that it is an exception when a member of this class makes a pronounced business success. Another 25 per cent. display in their windows a miscellaneous line of goods in such a manner as to make the window resemble a storeroom for surplus stock. The merchants of this class let their window displays run like their newspaper advertisements from three to six months without a change, and consequently receive but little return from them. Windows are worthy of careful consideration and close attention. They offer the cheapest and best advertising medium at the command of the retailer.

ADVANTAGES OF ATTRACTIVE WINDOWS.

A pleasing window is sure to attract attention and cause a passerby to stop, perhaps become interested in something shown, and then probably to enter the store and make a purchase. A good window frequently attracts the public's attention to the fact that goods are carried that were never before thought of in connection with the store. Then again a display may remind one of an article needed, or something required at a future time. When the article is wanted they will know where to find it.

The old adage, "Goods well displayed are half sold," is a positive fact, and the impression created by goods themselves is generally far better than any illustration or description of them that may be printed in an advertisement.

INCREASED SALES CAN BE TRACED.

Increased sales can be made and traced to window exhibits more easily than to an advertisement run for the same length of time in a local paper. The reason for this is that a better display can be made in a show window than in cold type. The great advantage offered by a window over the newspaper is that the people seeing the display are on the spot, and generally buy on the spur of the moment, while if the advertisement was read in the newspaper the matter would be talked over at home and it might be decided that it would be best to do without the article for the present. Then again goods are many times displayed in the window that could not be described to advantage in the newspaper, but being seen are easily sold.

THE NEWSPAPER ADVERTISEMENT HELPS.

While the show window forms one of the best possible advertisements, its efficiency can be greatly increased by showing in it the goods that are advertised in the local paper, and marking the prices plainly. A newspaper advertisement should also be so constructed as to call attention to all of the principal lines shown in the window. If the goods in the window come up to the expectation of the probable customer he will usually go into the store, and once in will probably become a purchaser.

FREQUENCY OF CHANGE.

A great variety of goods in the window is apt to cause a confusion of ideas, and it does not suggest anything in particular. Experience has proven that it is better to show but one or two lines at a time and make frequent changes in the display. When possible, the display should be changed once a week, and it is not a bad plan to sometimes change more frequently. Frequent changes teach shoppers passing the window to look for the new goods they may expect to see displayed most any time. It is best to display goods in the season in which they are used, or a little ahead of the season. Seasonable displays often sell goods without the aid of a salesman.

THE LIGHTING OF WINDOWS.

Too much stress cannot be laid on the point of having the windows well lighted. If situated in a town of any size and many pedestrians are passing the store after dark, it pays to have the window well lit so as to show the display to advantage. A display which may be very effective in the daytime loses its value as an advertisement at night if sufficient light is not thrown on it. In towns of 10,000 and over it is not a bad idea to have a light in the window all night, although it is not necessary to burn as bright a light late at night as early in the evening.

BACKGROUNDS.

The best color of background to be used can be decided by the window dresser. This depends very much on the class and color of the goods shown. If colors are used care should be taken that they harmonize with the goods displayed. A mistake is the displaying of goods without a background, for it is exceedingly difficult to show them to advantage without one. Common colored cheese cloth makes an excellent background, is very cheap and does not shut out all the light from the store, while at the same time it furnishes a wall to set off the goods. Wall paper can often be used to advantage for a background. It can be pasted on heavy paper or muslin, and hung back of the window, if there is no permanent back wall. A window ceiling can also frequently be utilized unless the store has a very low ceiling. The display can sometimes be brightened by cheese cloth, tissue paper, &c. The floor of the window should be painted or covered with cloth, carpet or some other material.

MECHANICAL APPLIANCES.

Special exhibits frequently make it necessary to use mechanical appliances. These are very useful in attracting attention to a window, for it is a well-known fact that a moving object will attract attention whether a good display of merchandise is shown or not. Poultry Netting displayed with the use of live rabbits and chickens will collect five times the number of people in front of a window who will look at the Netting, cards and prices, than if the Poultry Netting were displayed alone. Put a Sewing Machine in the window with some power to run it, get some old clothes and put them on a dummy skeleton such as is shown in Fig. 1, and stuff

Fig. 1.—Frame Work for Dummy.

it with straw or excelsior, place a head on it with a face having some kind of eyes, nose and mouth painted in with a marking brush, and fasten shoes to the bottom of the legs. Set the figure in a natural position in a chair in front of the Sewing Machine with the feet on the moving treadle. This will prove quite an attraction to the passerby and should sell some goods.

SHOULD PRICES BE MARKED?

Every wideawake merchant knows the value of putting prices on his goods with plain, neatly printed cards,

The marking of prices shows that the dealer has confidence in his goods and prices, and that he is not afraid of competition. The fact that a special feature is being made of goods makes the line so marked usually bring its prices without parleying on the part of the customer, and it often makes many sales.

STRIKING AND INGENIOUS DISPLAYS.

To make a good Sporting Goods display dress a figure in hunting suit and cap, fasten a Gun in its arms, in position as if aiming at a bird or an imaginary bird. Fill the window with Hunting and Sporting Goods, and it will be more attractive than if the display had been made without the figure.

For a Fishing Tackle and camping display get a small tent or some duck or cotton with which to make the representation of the end of a tent. Put in a background of brush and trees. A pane of glass put on the floor near the window, but not too close, will resemble a stream of water. Camp Stools, a Kettle, Fishing Rods, Shotgun, &c., should be placed near the tent. These all advertise goods sold in the store. Signs with reference to the goods and price cards will do the rest.

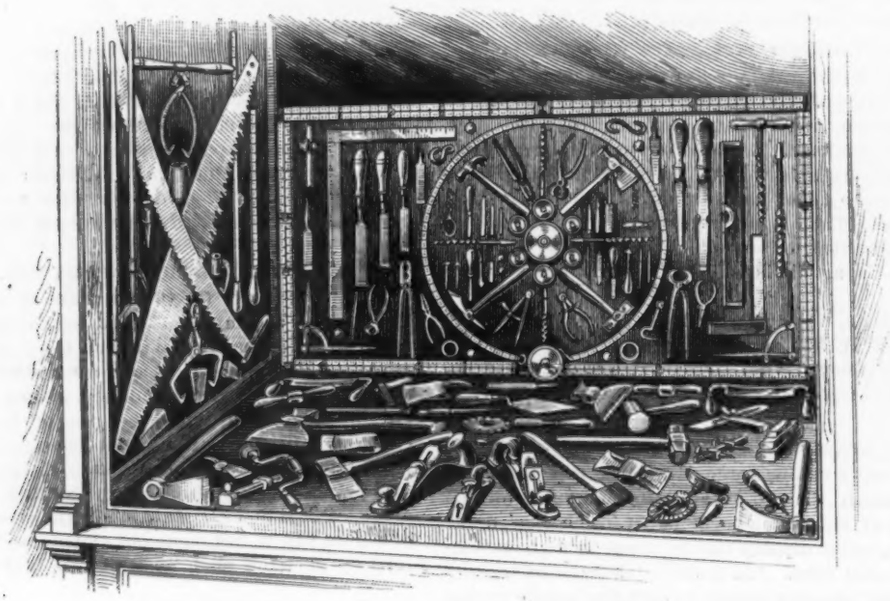


Fig. 2.—An Attractive Window of Tools.

To show Skates the floor of the window can be covered with large panes of glass. On these place a gas log, in front of which put some burned sticks and spread ashes around near them. Have one or two dummy figures dressed up and placed on Skates in proper position for skating. Take some salt and scatter over the glass in lines and circles to represent the tracks made by the Skates. These may be made in pigeonwings and fantastic figures as cut by skillful skaters. Some lines may be made to represent a crack in the ice, and an air hole may be shown by pouring a little water on one end of the pond. If this is done a sign should be placed near it warning skaters of the danger. The snow on the shore may be made by cotton banked up around the edge of the pond.

A GOOD WINDOW OF TOOLS.

To make an attractive window of Tools, such as is shown in Fig. 2, form a background of boards, covering it with black cotton flannel or cheese cloth. Get out small Carpenters' Tools, such as Chisels, Auger Bits, Marking Gauges, Screw Drivers, Drills, Driver Bits, Nail Sets, Hammers, Hatchets, Splitting Gauges, Rules, Tape Lines, Calipers, Compasses, &c. The board background may be divided, the halves being hinged together in the middle so that access may be gotten to the window without removing the entire background. Arrange the Tools as shown in the illustration. On the side walls put Cross Cut Saws, Cant Hooks, Timber Carriers, Rafting Augers, Rafting Dogs, Hooks and Cold Shuts, Swamp Hooks, Axes, Saw Tools, &c. On the floor place different kinds of Planes, Adzes, Braces, Drills, Tool Handles, Sets, &c.

TWO WINDOWS—THE OLD AND THE NEW.

Put these two displays in the two show windows at the same time. In one make an old fashioned wood fire place with Gas Log and Irons. A large stick of charred wood should be placed in the rear as a back log, but in such position that it will not catch fire. Plenty of wood ashes should be in sight, and there should be burnt sticks on the hearth. In the fire place have an old oven, the lid being partly off, showing some hoe cake or corn bread. In the ashes should be some potatoes, black as if they had just been roasted. An old English Kettle, if one can be found, should be suspended from the crane over the fire. Hang a string of peppers on a nail at the end of the mantel shelf, and place a jar supposed to be filled with lard in the chimney corner, having an old newspaper tied over the top with a rag string. Over the mantel hang an old Gun, the older the better. In a chair in front of the fire place a dummy figure of an old darky who has just come in from the fields and has fallen asleep while waiting for supper and toasting his feet. This figure can be dressed up in any old clothes. Make his head of black cloth filled with straw or excelsior, cover this with black moss and put on a false face. An old hat should be put on his head, and a colored handkerchief tied around his neck. The figure of his wife should be standing by the old table on which a candle is burning, and be in the act of setting the table for supper. The window will be completed by placing two or three old chairs in appropriate places, some bottles and old bric-a-brac, and china on the mantel and a chromo or two on the wall.

In the other window the new is represented by a modern cooking Range with necessary Steel and Enameled Cooking Utensils, a nice kitchen table, a sink in one corner of the kitchen, linoleum or other covering on the floor, a Galvanized Water Boiler next to the Range, some shelves with kitchen conveniences on them, a Gas Range and the other necessary things to make a modern kitchen. A neatly dressed figure of a cook should stoop and look into the oven at two nice loaves of bread just baked. Roasted potatoes should be on the upper shelf, dishes in the upper closet, &c. An advertisement in the local paper calling attention to the displays will bring many people to see them, particularly if the editor gives it a write up, which he will probably do if requested.

A COUNTRY SCENE.

Nothing in the show window attracts more interest nor invites more favorable comment than a reproduction of a pretty country scene. One of these showing a mill, mill pond, &c., can be made without great difficulty and will be worth the labor it costs. Get some old weather stained boards and shingles and construct the old mill, which should be no larger than a small dog house. On one side of the mill put a wooden or tin water wheel. Place the mill in the back of the window near the side wall of the store. Run a Hose connected with the water supply so as to have a small stream of water run over the wheel, but be careful to have the Hose concealed from view from in front. From the wheel run a tin gutter 6 or 7 inches wide diagonally across the window floor to a Galvanized Iron Pan 3 feet long by 2 feet wide and about 5 inches deep, which forms the mill pond. From this there should be an overflow about 1 inch from the top of the Pan. Care should be taken to have the mill raised above the pond so that the water will flow properly from the mill wheel through the gutter, forming the mill race to the pond.

Fill the whole floor of the window with dirt, covering all with closely cut sod, except a strip along the back of the window, where the dirt should be brought up level with the grass to represent a road leading to the mill. Place a little clay on the sides and bottom of the gutter and Pan which make the mill stream and lake, so as to hide the metal. The road can be separated from the grass by a stone wall, which can easily be made. On the back side of the road a high board fence can be formed of a board laid on its edge. This may be utilized to good advantage by painting signs on it, advertising the different goods in the store. Some plants or ferns can be set along the side of the lake and stream, but they should not be so large as to be out of proportion to the surroundings. On the road a Toy Horse and Wagon may be placed, the Wagon being loaded with stuffed sacks. The miniature figure of a man sitting on a stump at the side of the lake with a Fishing Rod in his hand will add to the interest of the scene.

A mechanical feature that can be easily added if one has a small water or electric motor is a seesaw. This can be easily made by fixing a miniature board so it will teeter on a miniature log. A dummy boy should be placed on one end and a girl on the other. The motor should be situated either in the front of the store or cellar, as near to the window as possible, and so geared as to make a horizontal shaft directly under the seesaw revolve slowly. A rod connected to a crank on this shaft, passing through the floor of the window and sod, and fastened to the seesaw will give it the regular teeter totter motion. Some chickens or rabbits can be put into the window, if desired.

PLANO HARVESTING MACHINERY.

THE PLANO MFG. COMPANY, Chicago, have just issued a very attractive catalogue, describing their specialties in Harvesting Machinery. This catalogue is the twenty-second annual greeting to the Farm Implement trade and is profusely illustrated. The illustrations show the Jones Lever Binder, the Jones Vertical Mower, the Jones Chain Mower, the Jones Hay Rake, the Plano Sickle Grinder, the Jones Mower Rake Attachment, the Plano Husker and Shredder, and the Jones Steel Header. Each of these machines is described in full detail, and the special devices used in the construction of each machine are separately illustrated and their advantages are presented in convincing language. Many of the improved devices thus used are of a unique character, showing the great ingenuity of the mechanical engineering experts connected with this company. The past year has seen three new leaders added to the company's line—namely, a Vertical Mower, a Corn Binder and a Husker and Shredder. It is claimed that the Hopkins Patent Spring Cutter Cap described in this catalogue, which has just been brought out, is the greatest improvement made on a Mowing Machine for 30 years. This invention secures for the sickle of the Mowing Machine a constant shear cut. It holds the knife down to its work against the ledger plates in the toughest cutting, and keeps the cutting edges together, preventing the wedging of the grass under the knife. The company have increased their manufacturing facilities during the year to enable them to keep up with the constant demand for their machinery.

A. L. ECCLES COMPANY.

A. L. ECCLES COMPANY, manufacturers' representatives, having leased an office in the Graham Building, 127 Duane street, New York, a stock of Hardware, Machinery, Metals and Railway Supplies will be carried by them in their warehouse in Front street. They are now representing 14 manufacturers of specialties in Machinery, Hardware and Tools, illustrated catalogues of which will be sent on application. Alfred L. Eccles for a period of 23 years was associated with the American Saw Company, Trenton, N. J., which plant was recently purchased by John A. Roebling's Sons Company, Henry Disston & Sons, Philadelphia, having succeeded to the Saw business. James L. Neefus for about 20 years has represented the concerns of C. E. Jennings & Co., J. C. McCarty & Co., and Alder & Boyd as city and export salesman.

PRICE-LISTS, CIRCULARS, &c.

C. T. WILLIAMSON WIRE NOVELTY COMPANY, Newark, N. J.: Catalogue No. 50, 60 pages, devoted to their extensive line of Corkscrews, Hooks, Champagne Taps and Bent Wire Goods. The company will be pleased to send the catalogue on request to those interested in this line.

O. LINDEMANN & Co., 81 Beekman street, New York: Catalogue, 42 pages, showing their line of Japanned, Brass and Tinned Wire Cages, also a full line of Cage Sundries.

J. S. ROWELL MFG. COMPANY, Beaver Dam, Wis.: Illustrated catalogue of the Tiger Seeders and Drills and Rowell cultivators and Hay Rakes.

FARMERS' HANDY WAGON COMPANY, Saginaw, Mich.: Catalogue descriptive of the Nye Pickers for sorting beans, peas, garden seeds, coffee, peanuts, &c.

THE STOLLBERG & CLAPP COMPANY, Toledo, Ohio: Spring circular, 112 pages, covering Steel Goods, Hay Tools, Lawn Mowers, Refrigerators, Screen Windows and Doors, Fishing Tackle, Sheep Shears, &c.

SANITARY SPECIALTY MFG. COMPANY, 55 and 57 North Clinton street and 24 to 30 Milwaukee avenue, Chicago: Catalogue of Tools specially suited to the wants of plumbers and steam fitters. This catalogue comprises only 48 pages, but its contents are remarkably comprehensive and varied, thus presenting a much greater assortment of Tools than would be expected from their apparent brevity. The Tools are all illustrated and a price-list accompanies each illustration.

BRIDGEPORT GUN IMPLEMENT COMPANY, 313-317 Broadway, New York: Illustrated booklet of their complete line of Bicycle Pedals, including varieties of the Star, Bridgeport and Record styles. Recent additions are the No. 3 Star Pedal, 1902 model, together with the Record Pedals Nos. 1 and 9, the business and manufacture of which they took over last spring, as announced in these columns.

Schaw, Ingram, Batcher & Co., Sacramento, Cal., who are both manufacturers and wholesale merchants, have divided their business into two distinct parts, both being incorporated. As manufacturers they will hereafter be known as Schaw-Batcher Company Pipe Works. The jobbing business will be continued under the style of the Schaw-Batcher Company.

Baldwin & Wilson have bought out the Hardware, Stove, Sporting Goods and Building Material business formerly conducted by Acker & Cole, Fayette, Ohio, and will continue at the old stand.

MISCELLANEOUS NOTES.

Crescent Razor Stropper.

In describing the Crescent razor stropper in the issue of January 9, manufactured by the Southington Cutlery Company, Southington, Conn., and 98 Chambers street, New York, it was referred to as a device for stropping the Crescent safety razor, which is the use for which it is intended, but the manufacturers direct special attention to the fact that it will with equal facility strop any of the various safety razor blades of similar shape now on the market. Concerning the steel spring in the stropper, the point is made that it is not a necessary part of the device, its only office being to keep the blade from cutting the strop if in the hands of a careless user, should the stropper be moved in an opposite direction without bringing suitable friction or pressure to bear in its contact with the strop.

Chicago Steel Mfg. Company, Hammond, Ind., have closed down their shovel department temporarily, and are giving special attention to their steel plate mill and cut steel nail mill. They are now turning out nail and tack plate from their rolling mill, and expect to be on the market inside of 30 days with a full line of steel and iron nails.

Ideal Series of .25-Caliber Bullets No. 257,231.

The Ideal Mfg. Company, New Haven, Conn., are offering molds for a new series of .25-caliber bullets, shown herewith. The shape of the extreme point of the bullets is referred to as being such as to permit their being seated in the shells with the regular tools for the 25-20 single shot and repeating rifles; also for the 25-21 and 25-25 Stevens. The bullet of 66 grains weight, it is said, will be found a very good one for short range, and the 88 grains weight is alluded to as being correct for full charge for the above mentioned rifles. For the 25-35 Winchester and 25-36 Marlin high pressure quick

Ideal Series of 25-Caliber Bullets No. 257,231.

twist rifles the three different weights, it is remarked, will be found very satisfactory; the 111 grains weight for 200 yards, 88 grains weight for 150 yards and the 66 grains weight for 100 yards or less. The bullets are formed on the lines of the .30-caliber Kephart. The base bands are wide and strong, so that they will not jump the quick twist. The forward portion is made small enough, it is pointed out, to obviate the possibility of the lead striking the barrel, while the front groove is for holding lubrication. The edge of the forward band is left sharp to act as a dirt scraper and catcher. It is stated that the lubrication will be the first to touch the barrel, and thus obviate leading. It is shown that with these bullets a greater number of shots may be made without cleaning than otherwise. Single molds will be made for any of the weights specified; single weights to cut off the point, and molds for casting all three weights.

W. A. Kehnast, Defiance, Ohio, who has been in the Hardware and Stove business at that point since April 1, 1870, has taken into partnership two of his oldest clerks, Abraham Smith, who has been identified with the business for 14 years, and Henry Roehrs, who has been connected with it for a period of 12 years. Mr. Kehnast alludes to this action as in the nature of a reward for faithful service. The new style of the concern will be the W. A. Kehnast Company.

Iron Age Combined Single Wheel Hoe, Hill and Drill Seeder No. 15.

Bateman Mfg. Company, Grenloch, N. J., have added to their line of Iron Age garden implements the single wheel hoe, hill and drill seeder herewith shown. Although a combined implement it possesses, it is stated,

Iron Age Combined Single Wheel Hoe, Hill and Drill Seeder No. 15.

every good feature of a tool designed especially as a wheel hoe or a seed drill. Its work from seeding to the last cultivation of the crop is referred to as ideal. The Iron Age catalogue for the season of 1902 is now ready for distribution and will be sent upon application by the manufacturers.

Automatic Micrometer Thickness Gauge.

Louis Schapper, Leipzig, Germany, for whom Cornelius Kahlen, 536-538 Pearl street, New York, is the representative for the United States and Canada, is the manufacturer of an automatic micrometer thickness gauge, as here illustrated, in addition to a large line of instruments of precision for various purposes. By pushing back a hinged lever at the top, the plunger under the dial is raised so that sheets of metal, paper, card, textiles or any substance can be slipped between the bottom plate and the plunger, to instantly ascertain the exact thickness up to ¼ inch. In connection with the brass plunger is a milled adjusting nut, by means of which allowance for wear can be made so that the pointer starts exactly from zero. The apparatus is strongly and finely made, the standard being of cast metal and massive, so there can be no possible exaggeration in results. The

Automatic Micrometer Thickness Gauge.

dial is 6 inches in diameter, the base 4⅛ inches across, extreme hight 8⅝ inches and weight 8 pounds. The gauges are made regularly to record thousandths of an inch, but for especially delicate work they furnish a gauge with a vernier on the pointer which subdivides the spaces into tenths, so that a reading of 10-1000 inch is obtained. The gauges are also made for metric measurements, one with a capacity of 2 mm., divided into thousandths of a millimeter, and one of 10 mm. capacity, divided into hundreth millimeters. The gauges have German silver dials, and the spaces are divided both decimally and by sixty-fourths of an inch, while one revolution of the pointer indicates ¼ inch, about 3-64 more than this can be shown as a part of a second revolution.

Current Hardware Prices.

REVISED JANUARY 21, 1902.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓&10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Cut Prices.—*In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.*

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (April 4, 1901), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, ₩ doz. $3.00....33⅓@33⅓&10%
North's.....10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent.....25&5%
Taplin's Perfection.....50%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Arm and Hammer, Wrought at ₩ lb 8¼@8¾c
Buel Patent Trenton.....₩ lb 9½@9¾c
Eagle Anvils.....₩ lb 7¼@7¾c
Hay-Budden, Wrought.....9c@9¼c
Horseshoe brand, Wrought.....9c@9.4c

Imported—

Peter Wright's.....9¼@9¾c

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....20%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz.....25%
Smaller Lots.....20%
Lots of 3 doz.....30%

Augers and Bits—

Com. Double Spur.....70@70&10%
Boring Machine Augers.....60&10&10@70&10%
Car Bits, 12-in. twist.....60@60&10%
Jennings' Pattern Auger Bits.....50&10&5@60%
Ford's Auger and Car Bits.....40&10%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. K. Jennings' list....40%
No. 30. K. Jennings' List.....50%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits 15&10@15&10&5%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60&10%
Snell's Car Bits, 12-in. twist.....60%
Wright's Jennings Bits (K. Jennings' list).....50%

Bit Stock Drills—

Standard List.....65@65&5%

Expansive Bits—

Clark's small, $18; large, $36.....50&10%
Lavigne's Clark's Pattern, No. 1, ₩ doz., $26; No. 2, $18.....50&10%
C. E. Jennings & Co., Steer's Pat.....33⅓%
Swan's.....6%

Gimlet Bits—

Common Double Cut..gro. $2.25@3.75
German Pattern.....gro. $3.25@4.50

Hollow Augers—

Bonney Pattern, per doz. $11.00@11.50
Ames.....25&10%
New Patent.....25&10%
Universal.....20%
Wood's Universal.....25%

Ship Augers and Bits—

Ford's.....40%
Snell's.....40%
C. E. Jennings & Co.:
L'Hommedieu's.....15&10%
Watrous'.....40%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled.....gro. $2.75@3.10
Unhandled, Shouldered..gro. 63@65c
Unhandled, Patent.....gro. 66@70c
Peg Awls:
Unhandled, Patent....gro. 31@34c
Unhandled, Shouldered..gro. 65@70c
Scratch Awls:
Handled, Common..gro. $3.50@4.00
Handled, Socket..gro. $11.50@13.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, best brands..$5.50@5.75
First Quality, other brands $5.25@5.50
Jobbers' Special Brands:
Good Quality.....$4.50@4.75
Best Quality.....$5.00@5.25
Cheap, Handled Axes.....$5.50@5.75
Beveled, add 25c doz.

Axle Grease—See *Grease, Axle.*

Axles—

Iron or Steel.
Concord, Loose Collar....4½@5c
Concord, Solid Collar....4¾@5¼c
No. 1 Common.....5¼@5¾c
No. 1 Com. New Style..5¼@5¾c
No. 2 Solid Collar.....4¾@4½c
Nos. 11 to 14.....70@70&10%
Nos. 15 to 18.....75@75&10%
Nos. 19 to 22.....75@75&10%
(Cash 10 days.)

Boxes, Axle—

Common and Concord, not turned.. 15. 4¼@4½c
Common and Concord, turned.... lb. 4¾@5c
Half Patent.....lb. 8@9c

Balances—Sash—

Caldwell new list.....50%
Pullman's.....60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%
Petoque.....50%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb.. 2¾@3c

Beams, Scale—

Scale Beams, List Jan. 12, '82.40&10%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters—Egg—

Standard Co.: ₩ gro.
No. 0 Rapid.....$4.50
No. 10 Dover Family Size.....$6.50
No. 15 Dover Hotel Size.....$12.00
Rivat.....$8.00
Taplin Mfg. Co.: ₩ g o.
No. 60 Improved Dover.....$6.50
No. 75 Improved Dover.....$7.50
No. 75-2 Imp'd Dover, Tin'd.....$9.00
No. 100 Improved Dover.....$8.00
No. 102 Improved Dover Tin'd...$9.50
No. 150 Improved Dover, Hotel..$15.00
No. 152 Imp'd Dover, Hotel, Tin'd..$17.00
Lyon's, Standard size.....₩ doz. $1.75
Wonder (E. S. & Co.).....₩ gro. $7.50

Bellows—

Blacksmith, Standard List.70@70&10%
C. E. Jennings & Co.. Blacksmith..60&10%
C. E. Jennings & Co., Hand.....33⅓%

Blacksmiths—

Inch..	30	32	34	36	38	40
Each	$3.50	3.75	4.25	4.80	5.35	6.15

Extra Length: Each..$4.00 4.55 5.10 5.60 6.40 7.50

Molders—

Inch..	9	10	11	12	14	16
Doz...	$6.75	7.25	8.50	9.50	12.00	14.50

Hand—

Inch...	6	7	8	9	10	12
Doz....	$3.75	4.25	4.50	5.00	5.7	6.75

(Net Prices.)

Bells—Cow—

Ordinary goods.....75&5@75&10%
High grade.....70@70&10%
Jersey.....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Barton Gong.....55%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's.....40@40&10%
Yankee Gong.....35%

Hand—

Hand Bells, Polished.....60&5@66⅔%
White Metal.....55@55&10%
Nickel Plated.....50@5.50&10%
Swiss.....60@60&7½%
Silver Chime.....33⅓@33⅓&10%

Miscellaneous—

Farm Bells.....lb. 2@2¼c
Steel Alloy Church and School..... 50&10&5@60%
National Bell Foundry Co.: Superior Cast Steel Church and School Bells.....50&10&5@60%
Wilmot & Hobbs Mfg. Co., Gongs.....70%

Belting—Rubber—

Agricultural (Low Grade).75&10@80%
Common Standard.....75@75&10%
Standard.....70@70&10%
Extra.....60&10@65%
High Grade.....50&10@50&10&5%
Boston Belting Co.:
Seamless Stitched, Imperial.....45&5%
Boston.....50&5%
Niagara.....60&5%

Leather—

Extra Heavy, Short Lap...50&10@60%
Regular Short Lap.....60@60&5%
Standard.....60&10@65&10%
Light Standard.....65@70%
Leather Lacing.....60&10%

Cotton—

Rossendale-Reddaway B. & H. Co.:
Sphinx Brand.....60&10%
Durable Brand.....70%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters.....20%
Stoddard's Lightning Tire Upsetters.....40@50%

Bicycle Goods—

John S. Leng's Son's 1899 list:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—Tackle—

Common Wooden.....70&10@75%
Cleveland Steel.....60&10@70%
Ford's Star Brand Self Lubricating.. 60&10%
Hollow Steel, Ford's Pat. Star Brand.... 50&10%
Lane's Patent Automatic Lock and Junior.....30%
Stowell's Novelty, Mal. Iron.....50&10%
See also *Machines, Hoisting.*

Boards Stove—

Zinc, Crystal, &c...40&10@40&10&5%

Bolts—

Carriage, Machine &c.—

Common, list Jan. 30, '95..65&2½@..%
Norway Iron, $3.00, list Oct. 7, '84.. 80@80&5%
Phila. Eagle, $3.00 list May 24, '99.... 80@80&10%
Bolt Ends, list Jan. 30, '95...70&5@..%
Machine, list Oct. 1, '99.....70&2½@..%
Machine with C. & T. Nuts.... 65&7½@..%

NOTE—*The rapid advances in manufacturers' prices enable the jobbers to cut prices freely.*

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch.....	3	4	5	6	8
Per doz...	$0.26	.30	.39	.47	.65

Cast Iron Spring Foot:

Inch.....	6	8	10
Per doz...	$1.00	1.25	1.75

Cast Iron Chain, Flat, Japanned:

Inch.....	6	8	10
Per doz...	$0.75	1.05	1.30

Cast Iron Shutter, Brass Knobs:

Inch.....	6	8	10
Per doz...	$0.57	.80	1.00

Wrought Barrel Brass Knob:

Inch.....	3	4	5	6	8
Per doz...	$0.44	.50	.61	.70	1.23

Wrought Barrel.....70@70&10@75&5%
Wrought " Bronzed..40@55@50&10%
Wrought Flush, B. K..50@70@80&10%
Wrought Shutter...40@10@10@60&5%
Wrought Square Neck.....50@50&10%
Wrought Sunk.....50@50&10%
Ives' Patent Door.....60%

Stove and Plow—

Plow.....60@65@...%
Stove.....77½%

Tire—

Common.....77½%
Norway Iron.....80@80@5%
American Screw Company:
Norway Phila., list Oct. 16, '84....82½%
Eagle Phila., list Oct. 16, '84.....85%
Bay State, list Dec. 28, '99.....77½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...82½%
Eagle Phila., list Oct. 16, '84.....85%
Eclipse, list Dec. 28, '99.....77½%
Port Chester Bolt & Nut Company
Empire, list Dec. 28, '99.....77½%
Keystone Phila. list Oct. '84.....85%
Norway Phila., list Oct. '84.....82½%
Upson Nut Co.:
Tire Bolts.....77½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	1¼	1½	1¾	2
Per doz...	$4.30	5.00	5.75	7.25
Inch.....	2¼	2½		
Per Doz...	$8.65	11.50		

Enterprise Mfg. Co. No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boring Machines—See *Machines, Boring.*

Boxes, Mitre—

C. E. Jennings & Co.....40%
Seavey's, per doz., $30.....40%

Braces—

NOTE.—*Most Braces are sold at net prices.*
Common Ball, American...$1.15@1.25
Barber's.....50&10&10@60&10%
Fray's Genuine Spofford s.....60%
Fray's No. 70 to 120, 31 to 123, 207 to 414.....60%
C. E. Jennings & Co.....50&10%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Patent..50%
P., S. & W. Co Peck's Patent..... 60&10@65&5%

Brackets—

Wrought Steel.....75&5@75&10%
Bradley's Wire Shelf:
Full cases.....80%
Broken cases.....75&10%
Griffin's Pressed Steel.....75%
Griffin's Folding Brackets.....70&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co.....75%

Buckets, Well and Fire—See *Pails*

Bucks, Saw—

Boss.....₩ gro. $48.00
Hoosier.....₩ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought list Sept., '96....40@40&5%
Cast Brass, Tiebout's.....30%

Cast Iron—

Fast Joint, Broad.....50@50&10%
Fast Joint, Narrow.....50@50&10%
Loose Joint.....70&5@70&10%
Loose Pin.....70&5@70&10%
Mayer's Hinges.....70&5@70&10%
Parliament Butts.....70&5@70&10%

Wrought Steel—

Table and Back Flaps.....60%
Narrow and Broad.....60%
Inside Blind.....66&10%
Loose Pin.....60&10%
Loose Pin, Ball and Steeple Tip.....75%
Japanned, Ball Tip Butts...60%
Bronzed Wrt. Nar. and Inside Blind Butts.....45&20@45&25%
(Extra 25%)

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....40&10%
Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb..3¼@4c
Sharp, 1 prong.....per lb...4@4¼c
Perkins' Blunt Toe.....₩ lb 3½@
Perkins' Sharp Toe.....₩ lb 4 @

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 75	2.10	2.25	each.
Iowa Pattern...	....	2.40	2.60	each.
Buffalo Pattern.	....	2.30	2.50	each.
	20	30	40	qts.
New York Patt'rn	3.00	3.25	3.40	each.
Baltimore Patt'rn	2.50	2.85	3.10	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	108 gro

Caps—Percussion—

Eley's E. B.....80c
G. D.....per M 32@34c
F. L.....per M 37@40c
G. E.....per M 47@50c
Musket.....per M 57@60c

Primers—

Berdan Primers, $1.00.....5%
B. L. Caps (Sturtevant Shells) $1.00.....5%
All other primers.....$1.10@$1 15

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—
Blank Cartridges:
22 C. F., $5.50 ..... 10@5@10@10%
32 C. F., $7.00 ..... 10@5@10@10%
22 cal. Rim, $1.50 ..... 10@5@10@10%
32 cal. Rim, $2.75 ..... 10@5@10@10%
B. B. Caps, Con...Ball Swgd. $1.80@1.85
B. B. Caps, Round Ball... $1.10@1.15
Central Fire ..... 25@25@5%
Pistol and Rifle ..... 15@5@15@10%
Primed Shells and Bullets ..... 15@5@15@10%
Rim Fire Sporting ..... 50@50@5%
Rim Fire, Military ..... 15@5@15@10%

Casters—
Bed ..... 70@10@70@10@5%
Plate ..... 75@10@75@10@5%
Philadelphia ..... 75@10@75@10@5%
Boss ..... 70@10%
Boss Anti-Friction ..... 70@10%
Martin's Patent (Phoenix) 45%
Payson's Anti-Friction ..... 70@10@10@10%
Standard Ball Bearing 45%
Tucker's Patent, low list 30%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—
American Coil, Cask lots:

3-16	¼	5-16	⅜	7-16	½	9-16
3.00	3.00	3.00	4.25	4.10	4.00	4.05
⅝	¾ to 1 in.				⅛ to 1¼ inch.	
3.85	3.80				3.75 per 100 lb.	

Less than Cask lots add 25c.
German Coil ..... 60@10@10%

Halters and Ties—
Halter Chain ..... 60@10@10@10%
German Halter Chain, list July 24, '97 ..... 60@10@60@10@10@5%
Cow Ties 60%

Trace, Wagon, &c.—
Traces, Western Standard: 100 pair
6½—6-8, Straight, with ring... $30.00
6½—6-2, Straight, with ring.. $31.00
6½—8-2, Straight, with ring.. $35.00
6½—10-2, Straight, with ring.. $38.00
Add 25 per pair for Hooks.
Twist Traces 25 per pair higher than Straight Link.
Trace, Wagon and Fancy Chains ..... 50@10@50@10@5%

Miscellaneous—
Jack Chain, list July 10, '93:
Iron ..... 60@10@60@10@10%
Brass ..... 60@10@60@10@10%
Safety Chain ..... 70@5@70@10%
Gal. Pump Chain ..... lb. 4@4½c
Covert Mfg. Co.:
Breast ..... 35@2%
Halter ..... 35@2%
Heel ..... 35@2%
Rein ..... 35@2%
Stallion ..... 35@2%
Covert Sad. Works:
Breast 70%
Halter 70%
Hold Back 70%
Rein 70%
Oneida Community:
Am. Coil and Halters ..... 40@45@5%
Am. Cow Ties ..... 45@50%
Eureka Coil and Halter ..... 45@50@5%
Niagara Coil and Halter ..... 45@50@5%
Niagara Cow Ties ..... 45@5@50@10@5%
Wire Dog Chains ..... 45@50@5%
Wire Goods Co.:
Dog Chain ..... 60@10%
Universal Dbl-Jointed Chain 50%

Chalk—(From Jobbers.)
Carpenters' Blue ..... gro. 42@45c
Carpenters', Red ..... gro. 37@40c
Carpenters', White ..... gro. 33@35c
See also Crayons.

Chalk Lines—See *Lines.*

Checks, Door—
Bardsley's ..... 40@10%
Columbia ..... 50@10%
Eclipse ..... 60@60@10%

Chests, Tool—
American Tool Chest Co.:
Boys' Chests, with Tools 55%
Youths' Chests, with Tools 40%
Gentlemens' Chests, with Tools 30%
Farmers', Carpenters', etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty 50%
C. E. Jennings & Co.'s Machinists' Tool Chests 20%

Chisels—

Socket Framing and Firmer
Standard List ..... 70@5@70@10%
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Socket Firmer No. 10 ..... 60@10%
C. E. Jennings & Co. Socket Framing No. 15 ..... 60@10%
Swan's ..... 70@5%
L. & I. J. White ..... 30@30@5%

Tanged—
Tanged Firmers ..... 40@5@40@10%
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Nos. 191, 181 ..... 25%
L. & I. J. White, Tanged ..... 25@5%

Cold—
Cold Chisels, good quality. lb. 13@15c
Cold Chisels, fair quality.. lb. 11@12c
Cold Chisels, ordinary ..... lb. 8@9c

Chucks—
Beach Pat., each $8.00 ..... 20%
Massey's Planer and Milling ..... 15@20%
Skinner Patent Chucks:
Combination Lathe Chucks 40%
Drill Chucks, Patent and Standard 30%
Drill Chucks, New Model ..... 2 %
Independent Lathe Chucks 40%
Improved Planer Chucks 25%
Universal Lathe Chucks 40%
Face Plate Jaws 40%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination 40%
Car Drill 30%
Geared Scroll 30%
Independent 40%
Union Drill 30%
Universal 40%
Face Plate Jaws 35%

Clamps—
Adjustable, Hammers' ..... 20@20&5%
Cabinet, Sargent's ..... 50&10%
Carriage Makers', J., S. & W. Co. ..... 40&10%
Carriage Makers' Sargent's ..... 50&10%
Beam, Parallel ..... 33⅓&10%
Lineman's, Union Drop Forge & Tool Co 40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners Sidewalk—
Star Socket, All Steel ..... ₩ doz. $4.00 net
Star Shank, All Steel ..... ₩ doz. $3.75 net
W. & C. Snaur, All steel, 7½ in. ₩ doz., $3.05; 8 in., $3.10; 8½ in., $3.25.

Cleavers, Butchers'—
Foster Bros 30%
New Haven Edge Tool Co.'s 40%
Fayette R. Plumb ..... 33⅓&33⅓&10%
P., S & W ..... 50@50&5%
L. & I. J. White 25%

Clippers—
Chicago Flexible Shaft Company
Handy Toilet ..... ₩ doz. $7.20
Mascotte Toilet ..... ₩ doz. $3.40
Monitor Toilet ..... ₩ doz. $9.00
Stewart's Patent ..... ₩ doz. $10.00

Clips Axle—
Eagle and Superior ¼ and 5-16 inch ..... 70@10%
Norway, ½ and 5-16 inch.. 70@70@10%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—
Hardware list:
Compression and Plain Bibbs ..... 65@5@65@10%
Globe, Kerosene, Racking, &c., Cocks ..... 65@10@70%

Coffee Mills—See *Mills, Coffee.*

Collars Dog—
Brass, Pope & Stevens' list 40%
Embossed, Gilt, Pope & Stevens' list 30@10%
Leather Pope & Stevens' list 40%

Compasses Dividers, &c.
Ordinary Goods ..... 75@75@5%
Bemis & Call Hdw. & Tool Co.:
Dividers 65%
Calipers, Call's Patent Inside 55%
Calipers, Double 65%
Calipers, Inside or Outside 65%
Calipers, Wing 60%
Compasses 50%
J. Stevens A. & T. Co ..... 25&10%

Compressors Corn Shock—
J. B. Hughes' ₩ doz $2.50

Conductor Pipe, Galva.—
L. C. L. to Dealers:

Territory.	*Not nested.*	*Nested.*
Eastern	70@2½@10%	70@5@10%
Central	65@10@10%	70@10%
Southern	65@10%	65@2½@10%
S. Western	60@12½@10%	60@15@10%

Terms, 2% for cash.
Jobbers receive extra 12½@2½ on carloads loose, and extra 12½ on carloads crated.
See also *Eave Troughs.*

Coolers, Water—

Nos.	2	3	4	6
Labrador	$11.50	$14.00	$17.50	$20.00
8 gal.				
$24.00				

Nos	3	4	6	8
Iceland	$23.00	$25.00	$30.00	$37.50
10	14 gal.			
$57.00	$72.00			

Coopers' Tools—
See *Tools, Coopers'.*

Cord—Sash—
Braided, Drab ..... lb. 25c
Braided, White, Common.. lb. 17@18c
Cable Laid Italian..lb. A, 18c; B, 16c
Common India ..... lb 9 @9½c
Cotton Sash Cord, Twisted ..... 12@16c
Patent Russia ..... lb. 12½@13c
Cable Laid Russia ..... lb. 13½@14c
India Hemp, Braided ..... lb 14@15c
India Hemp, Twisted ..... lb. 10@12c
Patent India, Twisted ..... lb. 10@13c
Pearl Braided, cotton ..... ₩ lb 17½¢
Massachusetts, White ..... ₩ lb 22½¢
Massachusetts, Drab ..... ₩ lb 26½¢
Eddystone Braided Cotton ..... ₩ lb 19¢
Harmony Cable Laid Italian ..... ₩ lb 18¢
Ossawan Mills:
Crown, Solid Braided White ..... ₩ lb 22¢
Braided, Giant, White ..... ₩ lb 20¢
Peerless:
Cable Laid Italian ..... 16¢
Cable Laid Russian ..... 14¢
Cable Laid India ..... 12¢
Braided India ..... 18¢
Phœnix, White ..... 19¢
Samson, Nos. 7 to 12:
Braided, Drab Cotton ..... ₩ lb 32½¢
Braided, Italian Hemp ..... ₩ lb 32½¢
Braided, Linen ..... ₩ lb 49¢
Braided, White Cotton, Spot ..... ₩ lb 28½¢
No. 6 extra, 1¢ extra.
Silver Lake:
A quality, Drab, 40¢ 15%
A quality, White, 35¢ 15%
B quality, Drab, 35¢ 15%
B quality, White, 30¢ 15%
Italian Hemp, 40¢ 15%
Linen, 57½¢ 15%

Wire, Picture—
Braided or Twisted ..... 35¢@10@...%
Note.—There is a good deal of confusion in lists, some using old list and others the new list.

Corn Knives and Cutters—See *Knives, Corn.*

Corn Planters—
See *Planters, Corn—*

Crackers, Nut—
Little Giant ..... ₩ gr. $34.00

Cradles—
Grain 50%

Crayons—
White Round Crayons, gross.. 5½@6c
Cases, 100 gro., $4.50, at factory.
D. M. Steward Mfg. Co.
Metal Workers' Crayons..gr. $2.50
Soapstone Pencils, round, flat or square ..... gr. $1.50
Rolling Mill Crayons ..... gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots 20%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crooks, Shepherds'—
Fort Madison, Heavy ..... ₩ doz. $7.00
Fort Madison, Light ..... ₩ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—
Victor Garden ..... ₩ doz. $10.00

Cutlery, Table—
International Silver Company:
No. 12 Medium Knives, 1847 ..... ₩ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ..... ₩ doz. $3.00
Wm. Rogers & Son ..... ₩ doz. $2.50
Simeon L. & Geo. H. Rogers Company:
12 dwt. Medium Knives ..... ₩ doz. $3.00
No. 77 Medium Knives ..... ₩ doz. $2.50

Cutters—Glass—
H. D. Mayhew Co 40%
Smith & Hemenway Co 50%

Meat—

Hale's..Nos.	*11 & 111*	*12 & 112*	*13 & 113*
Per doz ..	*$9.50*	*12.50*	*16.00*

American 30%

Nos	1	2	3	4	5	6
Each	$5	$7	$10	$25	$50	$60

Connecticut 50%

No	20	40	60	8	10	12
Each	$1.75	2.00	2.25	3.00	3.00	4.00

Enterprise ..... 25@25&7½%

Nos	5	10	12	22	32
Each	$2	$3	$2.50	$4	$6

Dixon's, ₩ doz ..... 30&10@40%

Nos	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Home No. 1, ₩ doz. $23.75 ..... 50&10%
Little Giant, ₩ doz ..... 33⅓&5@40%

Nos.	305	310	312	320	322
	$38.00	$48.00	$44.00	$71.00	$68.00

Sterling ..... 33⅓&5%

Nos	1	2
Each	$3.00	$2.50

New Triumph No. 605, ₩ doz. $24.00 ..... 30&10@40%
Woodruff's, ₩ doz ..... 30&10@40%

Nos	100	150
	$15.00	$18.00

Chadborn's Smoked Beef Cutter, ₩ doz. $60.00
Enterprise Beef Shavers ..... 25@30%

Slaw and Kraut—
Henry Disston & Sons:
Slaw, Corn Grater, &c 40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9 ..... 55%
Kraut Cutters 26 x 12, 40 x 12 ..... 40%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters 40%
Slaw Cutters, 1 Knife, ₩ gr. ..... $18@$20
Slaw Cutters, 2 Knife, ₩ gr. ..... $22@$30

Tobacco—
All Iron, Cheap ..... *doz. $4.25@$4.50*
Enterprise ..... 35@10%
National, ₩ doz. $21.00 ..... 40%
Sargent's, ₩ doz. No. 2 ..... 45&10%
Sargent's No. 12 and 21 ..... 50&10%

Washer—
Appleton's, ₩ doz. $16.00 ..... 50&10&10%
Bonney's 40%

Diggers, Post Hole, &c.—
Dalbey Post Hole Auger...per doz., $9.00
Iwan's Improved Post Hole Auger 40%
Iwan's Perfection Post Hole Digger ..... ₩ doz. $30.00
Kohler's Universal ..... ₩ doz. $14.00
Kohler's Little Giant ..... ₩ doz. $14.00
Kohler's Hercules ..... ₩ doz. $12.00
Kohler's Invincible ..... ₩ doz. $10.00
Kohler's Rival ..... ₩ doz. $9.00
Kohler's Pioneer ..... ₩ doz. $9.00
Never-Break Post Hole Diggers, ₩ doz. $24.00 ..... 60%
Samson, ₩ doz. $34.00 ..... 25%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Doors, Screen—
Porter's Plain, No. 6 ..... ₩ doz. $6.50
Porter's Ornamental, No. 70 ..... ₩ doz. $10.00

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, ₩ doz. $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Common Blacksmiths' Drill...each $1.50@$1.75
Blacksmiths' Self-feeding ..... *each* $3.75@4.00
Breast, Millers Falls, each $3.00 ..... 15&10%
Breast, P., S. & W ..... 40@40&5%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills Nos. 2 and 3 ..... 16@5%
Johnson's Drill Points ..... 25&10%
Ratchet, Curtis & Curtis 25%
Ratchet, Parker's 40%
Ratchet, Weston's ..... 20@25%
Ratchet, Whitney's, P. S. & W 50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 ..... 33⅓%

Twist Drills—
Standard List ..... 60@5@60@10%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Screw Driver Bits...per doz. 45@70c
Balsey's Screw Holder and Driver, ₩ doz. 2½-inch, $6; 4-in., $7.50; 6-in., $9..40%
Buck Bros 30%
Buck Bros' Screw Driver Bits 30%
Champion ..... 40&10%
Douglass Mfg. Co ..... 20@20&10%
Fray's Hol. H'dle Sets, No. 3, $12.00 ..... 50%
Gay's Double Action Ratchet 35%
Goodell's Automatic ..... 50&10&10@50&10&10&5%
Mayhew's Black Handle 50%
Mayhew's Monarch ..... 40&10%
New England Specialty Co ..... 50&10%
Sargent & Co.'s:
Nos. 1, 50, 55 and 60 ..... 50&10&10%
Nos. 20 and 40 ..... 60½&10%
Smith & Hemenway Co ..... 40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles ..... 70&10&10%
No. 80 ..... 70@70&10&10%
Swan's:
Nos. 65 to 68 ..... 50%
No. 40 ..... 40&10%
Nos. 25, 35 and 45 ..... 20&10&10%

Eave Trough Galvanized

Territory.	*L. C. L.*	
Eastern	75@10@10%	Carloads extra 12½%
Central	75@7½@10%	
Southern	70@7½@10%	
S. Western ...	70@10@10%	

Terms, 2% for cash.
See also *Conductor Pipe and Elbows.*

Egg Beaters—See *Beaters, Egg*

Egg Openers—
See *Openers, Egg.*

Elbows and Shoes—
Factory shipments 60%
Perfect Elbows (S. S. & Co.) 40%

Emery, Turkish—

	4 to 5	5 to 150	Flour
Kegs	lb. 5c	5½c	3½c
½ *Kegs*	lb. 5½c	5¾c	3¾c
Kegs	lb 5c	6c	
10-lb cans, 10 in case	6½c	7c	8c
10-lb. cans, less than 10	10c	10c	8c

NOTE.—*In lots 1 to 3 tons a discount of 10% is given.*

Enameled and Tinned Ware—See *Ware, Hollow.*

Escutcheon Pins—
See *Pins, Escutcheon.*

Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's ..... 50&10%

Faucets—
Cork Lined ..... 70@5@70@10@5%
Metallic Key, Leather Lined ..... 70@70@10%
Red Cedar ..... 60@50@10%
B. & L. B. Co.:
Lockport, Metal Plug, reduced list 40&5%
Star ..... 60@60&5%
Star, Metal Plug new list ..... 40@40&5%
West's Lock, Open and Shut Key 50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Metal Key 50&10%
John Sommer's Duplex Metal Key 60%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined 50%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 50%
John Sommer's Perfection Cedar 40%
McKenna, Brass:
Burglar Proof, N. P 35%
Improved, ¾ and ⅞ inch 35%
Self Measuring:
Enterprise, ₩ doz. $60.00 ..... 40&10%
Lane's, ₩ doz. $36.00 ..... 40&10%
National Measuring, ₩ doz. $66.00 ..... 40%

Felloe Plates—
See *Plates, Felloe.*

Files—Domestic—
List revised Nov. 1, 1899.
Best Brands ..... 70@75&5%
Good Brands ..... 75&10@75&10@10%
Fair Brands ..... 80@80@10%
Second Quality ..... 80@10@80@25%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97 ..... 25%

Fixtures, Grindstone—
Net Prices:

Inch....	*15*	*17*	*19*	*21*	*24*
Per doz..	*$2.60*	*$2.75*	*3.00*	*3 50*	*4.50*

P., S. & W. Co ..... 50@50&5%
Reading Hardware Co 60%
Sargent's ..... 60&10&10%
Stowell's Giant Grindstone Hanger ..... ₩ doz. $8.00
Stowell's Grindstone Fixtures, Extra Heavy ..... 50&10&10%
Stowell's Grindstone Fixtures Light ..... 60&10%

Fodder Squeezers—
See *Compressors.*

Forks—
Sept. 1, 1900, list.
Grain or Barley Forks, 18 to 20 inches ..... 70@6% Extra 20@5%
Hay, 2 tine 65%
Hay, 3 tine 66⅔%
Hay, 4 tine. Header and Barley Forks, 13 to 16 inches 66⅔%
Manure, 4 tine 70%
Manure, 5 and 6 tine 70%
Spading ..... 70@5%
Iowa Dig-Easy Potato 65%
Victor, Hay 66⅔%
Victor, Manure 70%
Victor, Header ..... 60&30%
Champion, Hay 66⅔%
Champion, Manure 70%
Columbia, Hay ..... 66⅔&5%
Columbia, Manure 70%
Columbia, Spading 70%
Hawkeye Wood Barley 4 tine ₩ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger 65%
Acme Hay ..... 60&10&7½%
Acme Manure, 4 tine ..... 60&20&10%
Acme Manure, 6 tine ..... 60%&10&2%
Dakota Header ..... 65&15&5%
Jackson Steel Barley ..... 65&15&5%
Kansas Header 66⅔%
W. & C. Favorite Wood Barley 4 tine, ₩ doz., $5.00; 6 tine, $6.00
Plated.—See *Spoons.*

Frames—Saw—
Red, Polished and Varnished..doz. $1.15@$1.30
White ..... *doz. 75@80c*

Screens and Frames—
See *Screens.*

Freezers Ice Cream—

Qts...	*2*	*3*	*4*	*6*	*8*	*10*
Best	$1.15	1.65	1.95	2.40	3.00	4.20
Good	1 25	1.40	1.70	2.15	2.75	3.75
Fair	1.00	1.10	1 30	1.75	2.25	3.00

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse—
Per 1000 Feet.
Hemp Fuse $2.60
Cotton Fuse 2.90
Single Taped Fuse 3.25
Double Taped Fuse 4.20
Triple Taped Fuse 5.00
Less 5%

Gates, Molasses and Oil—
Stebbins ..... 80@80&10%

Gauges—
Marking, Mortise, &c. ..... 55¢10@55¢10¢10%
Barrett's Comb. Roller Gauge. ..... ₱ doz. $6.75@7.25
Stanley R. & L. Co.'s Butt & Babbet Gauge ..... 20@20&10&10%
Wire, Brown & Sharpe's 25%
Wire, Morse's 25%
Wire P., S. & W. Co ..... 30@30&10%

Gimlets— Single Cut—
Nail, Metal, Assorted, gro. $1.40@1.60
Spike, Metal, Assorted gro. $2.80@3.25
Nail, Wood Handled, Assorted, gro. $1.75@2.00
Spike, Wood Handled, Assorted gro. $2.25@3.50

Glass, American Window
Jobbers' List, Jan. 21, 1901.
Less than Car Lots from Store 90%
Carloads from Store ..... 90¢7½%
Car Lot Consignments, f.o.b. factory. 90¢12½%

Glue—Liquid, Fish—
List A, Bottles or Cans, with Brush. 37½@50%
List B, Cans (¼ pts., pts., qts.) ..... 33⅓@48%
List C, Cans (¼ gal., gal.) .... 25@45%
International Glue Co. (Martin's) ..... 40&10&50%

Glue Pots— See *Pots, Glue.*

Grease, Axle—
Common Grade ..... *gro. $5.00@6.00*
Dixon's Everlasting .... 10-lb pails, ea. 85¢
Dixon's Everlasting, in bxs., ₱ doz. 1 lb $1.20; 2 lb $2.00
Snow Flake: 1 qt. cans, per doz. $2.00; 2 qt., $3.20; 1 gal. cans per doz. $6.00; 3 gal. $16.00; 5 gal. $24.00 } 33⅓%

Grindstones—
Bicycle Emery Grinder $6.50
Bicycle Grindstones, each ..... $2.50@3.00
Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz. ..... $2.00 } 33⅓%
Pike Mower Knife and Tool Grinder, each ..... $6.00 }
Velox Ball Bearing, mounted, Angle Iron Frames ..... each, $3.25

Guards, Snow—
Cleveland Wire Spring Co.:
Galv. Steel ₱ 1000 ..... $9.00
Copper ₱ 1000 ..... $18.00

Gun Powder— See *Powder.*

Hack Saws— See *Saws.*

Hafts, Awl— *gro.*
Peg Patent, Leather Top .. *$4.50@5.25*
Peg Patent, Plain Top .... *$3.50@3.75*
Sewing, Brass Ferrule ..... *$1.50@1.60*
Saddlers', Brass Ferrule .. *$1.35@1.45*
Peg, Common ..... *$1.25@1.35*
Brad, Common ..... *$1.50@1.75*

Halters and Ties—
Covert Mfg. Co.:
Web ..... 45&2%
Jute Rope ..... 45&2%
Sisal Rope ..... 30&2%
Covert's Saddlery Works:
Web and Leather Halters 70%
Jute and Manila Rope Halters 70%
Sisal Rope Halters ..... 60&20%
Jute, Manila and Cotton Rope Ties .. 70%
Sisal Rope Ties ..... 60&30%

Hammers—
Handled Hammers—
Heller's Machinists' ..... 50&50&5%
Heller's Farriers ..... 50&50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.35, $1.50, $1.75 ..... 40@40&10&10%
Peck, Stow & Wilcox ..... 50&10%
Fayette R. Plumb:
Plumb, A. E. Nail .. 33⅓&5&33⅓&10&5%
Engineers' and B. S. Hand ..... 50&10&7½&50&10&10&7½%
Machinists' Hammers ..... 50&10@50&10&10%
Riveting and Tinners' ..... 40&7½&40&10&7½%
Sargent's C. S. New List 45%

Heavy Hammers and Sledges—
3 lb. and under ... *lb. 45c* } 75&10&5
3 to 5 lb. ..... *lb. 35c* } @..%
Over 5 lb. ..... *lb. 30c* }
Wilkinson's Smiths' ..... *9½c@10c lb.*

Handcuffs and Leg Irons
See *Police Goods.*

Handles—
Agricultural Tool Handles—
Axe, Pick, &c ..... *60@60&10%*
Hoe Rake, Fork, &c. ..... *60@60&10%*
Shovel, &c., Wood D Handle .. *50@50&5%*
Cross-Cut Saw Handles—
Atkins' ..... 40&5%
Champion ..... 45@45&10%
Disston's 50%
Mechanics' Tool Handles—
Auger, assorted ..... *gro. $2.30@3.50*
Brad Awl ..... *gro. $1.25@1.50*
Chisel Handles:
Apple Tanged Firmer, gro. ass'd. $2.25@2.35; large, $2.50@2.60.
Hickory Tanged Firmer, gro. ass'd. $1.75@2.20; large, $3.50@3.70.
Apple Socket Firmer, gro. ass'd, $1.70@1.85; large, $2.00@2.25
Hickory Socket Firmer, gro ass'd. $1.60 @ $1.75; large, $1.75 @ $2.00
Hickory Socket Framing, gro. ass'd, $2.50@2.75; large, $2.65@2.85
File, assorted ..... *gro. $1.60@1.15*
Hammer, Hatchet, Axe, &c *60%*
Hand Saw, Varnished, doz. 70@75c
Not Varnished ..... *55@60c*
Plane Handles:
Jack, doz. 25c; Jack Bolted .. 55@60c
Fore, doz. 35@38c; Fore, Bolted .. 70@75c
Nicholson Simplicity File Handle, ₱ gro. ..... $0.85@$1.20

Hangers—
Barn Door, New Pattern, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*	*8*
Doz	$0.85	1.20	1.50	1.90	2.30

Barn Door, New England Pattern, Check Back, Regular:

Inch	*3*	*4*	*5*	*6*
Doz	$1.30	1.75	2.50	3.00

Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 40%
Railroad 55%
Columbian Hdw. Co.:
American Trackless ..... 33⅓&10%
Cronk Hanger Co.:
Loose Axle 60%
Roller Bearing ..... 60&10%
Lane Bros.:
Parlor, Ball Bearing $4.00
Parlor, Standard $3.25
Parlor, New Model $3.75
Parlor New Champion $2.25
Barn Door, Standard ..... 60&10%
Covered ..... 50&10&10%
Special ..... 60&10%
Lawrence Bros.:
Advance 60%
Cleveland 70%
Crown 60%
New York 60%
Peerless ..... 60&10%
Sterling 60%
McKinney Mfg. Co.:
No. 1, Special, $15 ..... 60&10%
No. 2, Standard, $18 ..... 60&10%
Myers' Stayon Hangers and Track. 50&10% (net)
Stowell Mfg. and Foundry Co.:
Acme Parlor Ball Bearing 40%
Atlas 60%
Badger Barn Door 50%
Baggage Car Door 50%
Climax Anti-Friction 50%
Elevator 40%
Express 50%
Interstate 40%
Lundy Parlor Door 50%
Magic 50%
Matchless 60%
Nansen ..... 60&10%
Railroad 50%
Street Car Door 50%
Steel, Nos. 300, 404, 500 .... 40&15%
Stowell Parlor Door 50%
Wild West, Nos. 300, 404, 500 ..... 50%
Zenith for Wood Track 50%
Taylor & Boggis Foundry Co.:
Kidder's ..... 50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing ..... 60&10%
C. J. Roller Bearing ..... 60&10%
Cycle Ball Bearing 50%
Dwarf Ball Bearing 40%
Ives, Wood Track ..... 60&10%
L.T. Roller Bearing ..... 60&10&5%
New Era Roller Bearing ..... 50&10%
O. K. Roller Bearing ..... 60&10&5%
Prindle, Wood Track 60%
Richards' Wood Track 60%
Richards' Steel Track ..... 50&10%
Spencer Roller Bearing ..... 60&10%
Tandem Nos. 1 and 2 ..... 60%
Underwriters' Roller Bearing 40%
Velvet 50%
Wilcox Auditorium Ball Bearing 20%
Wilcox Barn Trolley No. 123 ..... 40%
Wilcox Elevator Door Hangers, Nos 112 and 122¼ 50%
Wilcox Elevator Door Hangers, No. 132 ..... 40%
Wilcox Fire Trolley, Roller Bearing 30%
Wilcox Le Roy Noiseless Ball Bearing 40%
Wilcox New Century ..... 50&10&10%
Wilcox O. K. Steel Track 50%
Wilcox O. K. Trolley 50%
Wilcox Trolley Ball Bearing 40%
Wilcox Wideman Narrow Gauge Ball Bearing 40%

Harness Menders— See *Menders.*

Harness Snaps— See *Snaps.*

Hasps—
McKinney's Perfect Hasp ₱ doz. 50%
Wrought Hasps, Staples, &c.—See *Wrought Goods.*

Hatchets—
Best Brands ..... *50@50&10%*
Cheaper Brands ..... *60@60&10%*
Note.—Net prices often made.

Hay and Straw Knives—
See *Knives.*

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind:
(Victor; National; 1888 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*2*	*5*
Doz. pair	*$0.75*	*1.55*	*2.90*

Mortise Shutter:
(L. & P., O. S., Dixie, &c.)

No.	*1*	*1¼*	*2*	*2½*
Doz. pair	*$0.60*	*.55*	*.32*	*.45*

Mortise Reversible Shutter, (Buffalo, &c.)

No.	*1*	*1½*	*2*
Doz. pair	*$0.65*	*.60*	*.55*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Parker ..... 70@75%
Reading's Gravity ..... 75&10%
Sargent's, Nos. 1, 3, 5, 11 & 18 ..... 70&10&70&20%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $0.30; with screws, $1.15.
Wrightsville H'dware Co.:
O. S., Lull & Porter ..... 80&2½%
Acme, Lull & Porter ..... 75&10%
Queen City Reversible ..... 75&10%
Stenger's Positive Locking, Nos. 1 & 3 ..... 70&10&5%
Shepard's Noiseless, Nos. 60, 65, 55 ..... 70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&7½%
1888, Old Pat'n, Nos. 1, 3 & 5 .... 75&7½%
Tip Pat'n, Nos. 1, 3 & 5 ..... 75&7½%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 75&7½%
Shepard's Double Locking, Nos. 20 & 25 ..... 70&10%
Champion Gravity Locking, No. 75 ..... 75&7½%
Steamboat Gravity Locking, No. 10 ..... 75&7½%

Extra 5@10% often given.

Pioneer, Nos. 000, 45 & 5½ ..... 75&7½%
Empire, Nos. 101 & 103 ..... 70&7½%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with Latches	*$1.80*	*1.20*	*2.65*
Hinges only	*$1.20*	*1.40*	*2.00*
Latches only	*.60*	*.80*	*.65*

New England:
With Latch ..... *doz* .... *@$1.55*
Without Latch ... *doz.* .... *@$1.25*
Reversible Self-Closing:
With Latch ..... *doz.* .... *@$1.80*
Without Latch .... *doz.* .... *@$1.45*
Western:
With Latch ..... *doz. $1.40@1.75*
Without Latch ... *doz. $0.95@1.20*
Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets,

No.	1	2	3
Hinges with Latches	$1.80	2.00	2.75
Hinges only	1.20	1.50	2.10
Latches only	.65	.65	.70

Spring Hinges—
Holdback, Cast Iron, gro. *$8.00@9.00*
Non-Holdback, Cast Iron ..... *gro $7.00@7.50*
J. Bardsley
Bardsley's Patent Checking 15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges 40%
Bommer Spring Hinges 40%
Chicago Spring Butt Co.:
Chicago 25%
Floor Hinge 50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Triple End 50%
Columbian Hdw. Co.:
Acme, Wrt. Steel 30%
Acme, Brass 20%
American 30%
Columbia, No. 14 ..... ₱ gr. $9.00
Columbia, No. 18 ..... ₱ gr. $25.00
Columbia, Adjustable 30%
Gem new list 25%
Clover Leaf ..... ₱ gr. $12.50
Oxford new list 25%
Hoffman Hinge & Foundry Co.:
No. 70 & 80 Holdback Detachable $8.50
Lawson Mfg. Co.:
Marchi ss 35%
Matchless Pivot 45%
Payson Mfg. Co.:
Oblique ..... 50&10%
Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr. $13.50
Ideal, No. 4 ..... ₱ gr. $9.00
New Idea No. 1 ..... ₱ gr. $9.00
New Idea, Double Acting 45%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list Mar. 15, 1901:
Light Strap Hinges 70%
Heavy Strap Hinges .. 75&10%
Light T Hinges 66⅔%
Heavy T Hinges ..... 60&5%
Extra Heavy T Hinges 75%
Hinge Hasps 55%
Cor. Heavy Strap ..... 75&10%
Cor. Ex. Heavy T 75%
Screw Hook and Strap: 6 to 12 in ..... lb 3½c; 14 to 20 in ..... lb. 3 c; 22 to 36 in ..... lb. 2¾c
Screw Hook and Eye:
¾ to 1 inch ..... *lb. 5 c*
⅝ inch ..... *lb. 6 c*
½ inch ..... *lb. 7 c*

Extra @ 20&10%

Miscellaneous—
Hoffman's Steel Spring Butt Hinges ..... 40&10%
Hoffman's Offset Refrigerator Hinges ..... 40&10%

Hods, Coal—

	15	*16*	*17*	*18 inch.*
Galv. Open	*$2.70*	*3.00*	*3.30*	*3.60 ₱ doz.*
Jap. Open	*$2.10*	*2.40*	*2.70*	*3.00 ₱ doz.*
Galv. Funnel	*$3.30*	*3.60*	*3.90*	*4.20 ₱ doz.*
Jap. Funnel	*$2.70*	*3.00*	*3.30*	*3.60 ₱ doz.*

Hoes— Eye—
Scovill and Oval Pattern ..... 60¢5@60¢10¢5%
Grub, list Feb. 23, 1899 .... 70@70¢10%
D. & H. Scovill 35%

Handled—
Sept. 1, 1900, List:
Field and Garden ..... *75¢2%*
Ladies', Boys', Toy and Onion ..... *70¢10¢10%*
Street and Mortar ..... *75¢7½¢2%*
Cotton ..... *70¢10¢10¢5¢2%*
Planters' ..... *70¢30%*
Weeding *75%*
Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.
Ft. Madison Crucible Garden Hoe ..... 75&2%
Ft. Madison Crescent Cultivator Hoe, per doz. ..... 75&10&2%
Ft. Madison Mattock Hoes:
Regular Weight ..... ₱ doz. $4.50
Junior Size ..... ₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4.80
Ft. Madison Dixie Tobacco Hoe .. 75&20%
Kretsinger's Cut Easy, per doz .... 75&2%
Warren Hoe 50%
W. & C. Ivanhoe ..... 75&2%
B. B. Cultivator Hoe ..... 75&10&2%
Acme Weeding ..... 75&10&2%
W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

Hog Rings and Ringers—
See *Rings and Ringers.*

Hoisting Apparatus—
See *Machines, Hoisting.*

Hollow Ware—
See *Ware, Hollow.*

Holders— Bit—
Angular, ₱ doz. $24.00 ..... 45&10%
Door—
Empire 50%

File and Tool—
C. E. Jennings & Co. Model Tool Holders 33⅓%
Nicholson File Holders and File Handles 33⅓%

Hooks— Cast Iron—
Bird Cage, Reading 60%
Bird Cage, Sargent's List ..... 50&10&60%
Ceiling, Sargent's List ..... 40&10%
Clothes Line, Hoffman's ..... 40&10%
Clothes Line, Reading List ..... 65&10&65&10&10%
Clothes Line, Sargent's List ..... 50&10&65&10%
Coat and Hat, Sargent's List ..... 45&10%
Clothes Line, Stowell's 70%
Coat and Hat, Stowell's 70%
Coat and Hat, Reading ..... 70&75%
Coat and Hat, Wrightsville ..... 65&10%
Harness, Reading List ..... 70&10&75%

Wire—
Belt *80%*
Wire C. & H. Hooks .. *60@60&10@60&10&5%*
Atlas, Coat and Hat:
Single Cases 45%
10 Case Lots ..... 45&10%
Czar Harness ..... 50&10&5%
Wire Coat and Hat:
Acme 60%
B. B 60%
V Brace, Chief and Czar 60%
Gem 60%
Bright Wire Goods—See *Wire.*

Wrought Iron—
Box, 6 in., per doz. $1.50; 8 in., $1.75; 10 in., $2.00.
Cotton ..... *doz. $1.05@1.25*
Wrought Staples, Hooks, &c.—See *Wrought Goods.*

Miscellaneous—
Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50
Grass ..... *Nos. 1 2 3 4*
Best *$1.50 1.75 2.00*
Common *1.30 1.50 1.40 1.60*
Potato and Manure *70%*
Whiffletree ..... *lb. 4½c*
Hooks and Eyes:
Brass ..... *60¢10¢10@70%*
Malleable Iron ..... *70¢5@70¢10%*
Covert Saddlery Works' Self Locking Gate and Door Hook 60%
Crown Picture ..... 50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—See *Knives, Corn.*

Horse Nails— See *Nails, Horse*

Horseshoes—
See *Shoes, Horse.*

Hose Rubber—
Garden Hose, ¾-inch:

Competition	*ft.*	*4¼@*	*4¼@*	
3-ply Standard	*ft.*	*5*	*@ 6*	*
4-ply Standard	*ft.*	*8*	*@ 9*	*
3-ply extra	*ft.*	*9*	*@10*	*
4-ply extra	*ft*	*11*	*@12*	*

Cotton Garden, ¾-in., coupled:

Low Grade	*ft.*	*6*	*@7* *
Fair quality	*ft.*	*8*	*@9* *

Irons— Sad—
From 4 to 10 ..... *lb 3@3¼c*
B. B. Sad Irons ..... *lb. 3½@4c*
Chinese Laundry ..... *lb. 5@5½c*
Chinese Sad ..... *lb. 3½@3¼c*
Mrs. Potts', per set:

Nos.	*50*	*55*	*60*	*65*
	65@70c	*60@65c*	*75@80c*	*70@75c*

New England Pressing, lb.. 3½@3¼c

Soldering—
Soldering Coppers, 1 & 1¼ lb., $1 @ 1 2 lb., and up ..... *12@20c*
Covert Mfg. Co ..... 30&2%
Smith & Hemenway Co's Sets 70%

Pinking—
Pinking Irons ..... *doz. 50@60c*

Jack Screws— See *Screws.*

Jacks, Wagon—
Covert Mfg. Co., Steel ..... 45&2%
Covert's Saddlery Works':
Daisy ..... 60&10%
Victor ..... 60&10%
Lockport ..... 40@40&10%
Lane's Steel ..... 33⅓&5%

Kettles—
Brass, Spun, Plain ..... *20@25%*
Enameled and Cast Iron—See *Ware, Hollow.*

Knife Sharpeners—
See *Sharpeners, Knife.*

Knives—
Butcher, Shoe, &c.—
Foster Bros.' Butcher, &c 30%
Hartzell Cutlery Co ..... 30&5%
Smith & Hemenway Co ..... 40&10%
Hay and Straw—See *Hay Knives.*

Corn—
Ft. Madison Cut-Easy, ₱ doz. $3.25
Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List ..... *70&5@70¢10%*
Adjustable Handle 25%
Bradley's 35%
Cantelo's Folding ..... 50@50&5%
C. E. Jennings & Co. Nos. 45, 46 .. 40&10%
Jennings & Grime ..... 60&5&5%
Swan's ..... 70&10&2½%
Watrous 25%
L. & J. White ..... 20@25@25%

Hay and Straw—
Lightning ..... *per doz. $5.00@5.25*
Iwan's Sickle Edge ..... ₱ doz. $10.00
Iwan's Serrated ..... ₱ doz., $11.00
Maine ..... ₱ doz., $8.50

Mincing—
Buffalo ..... ₱ gro. $15.00

Miscellaneous—
Farriers' ..... *doz. $2.00@3.00*
Woestenholm's ..... ₱ doz. $3.00@3.25

Knobs—
Base, ¾-inch, Birch, or Maple, Rubber tip, gro ..... *$1.30@1.25*
Carriage, Jap, all sizes .. gro. 30@35c
Door, Mineral ..... *doz. 60@65c*
Door, Por. Jap'd ..... *doz. 65@70c*
Door, Por. Nickel .... *doz. $2.00@2.10*
Bardsley's Wood Door, Shutter, &c. .. 15%
Picture, Sargent's ..... 60&10%

Lacing Leather—
See *Belting, Leather—*

Ladders Step Etc.—
Goshen Mfg. Co.'s Step, etc 50%
Myers' Noiseless Store Ladders 50%

Ladles— Melting—
L. & J. Mfg. Co. 25%
P. S. & W. 5%
Reading 6%
Sargent's ..... 40@40&10%

Lanterns— Tubular—
Regular Tubular ..... doz. $4.35@4.75
Side Lift Tubular ..... doz. $4.75@5.25
Square Lift Tubular ..... doz. $4.75@5.25
Other Styles ..... 40@40&10@40&10%

Bull's Eye Police—
No. 1, 2¾ inch $3.60
No. 2, 3 inch $4.00

Latches, Thumb—
Roggin's Latches ..... doz. $0@33c

Lawn Mowers—
See *Mowers, Lawn.*

Leaders. Cattle—
Small ..... doz. 50c; large, 55c
Covert Mfg. Co. ..... 45&2%

Lemon Squeezers—
See *Squeezers, Lemon.*

Lifters, Transom—
Solid Comp, Payson Mfg. Co. 80%
R & E 45%

Lines—

Wire Clothes, Nos...	18	19	20
100 feet	$2.20	2.00	1.65
75 feet	$1.80	1.70	1.30

Cassawan Mills.
Crown Solid Braided Chalk 33⅓%
Mason's, No. 0 to No. 5 ..... 33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3 ..... 10%
Silver Lake Braided Chalk, No. 0, $6.00;
No. 1, $5.50; No. 2, $7.00; No. 3, $7.50
₩ gr. 30%

Locks— Cabinet—
Cabinet Locks ..... 33⅓@33⅓&7½%

Door Locks, Latches, &c.—
[Net prices are very often made on these goods.]
Reading Hardware Co. 50%
R. & E. Mfg. Co. 50%
Sargent & Co. ..... 40@40&10%

Elevator—
Stowell's 40%

Padlocks—
Wrought Iron ..... 7@10@5@80@5%
R. & E. Mfg. Co. Wrt. Steel and Brass. 50%

Sash, &c.—
Fitch's:
Bronze and Brass ..... 60@5%
Iron 70%
Ives' Patent:
Bronze and Brass 62½%
Iron 65%
Wrought Bronze and Brass ..... 55@5%
Wrought Steel 60%
Payson's signal 20%
Reading ..... 6@10@10@70%

Machines— Boring—
Common, Upright, Without Augers, $2.00
Common, Angular, Without Augers, $2.25

	Without Augers.	
R. & E. Mfg. Co.:	Upright.	Angular.
Improved No. 3.	$4.25	No. 1 $5.00
Improved No. 4.	3.75	No. 2 3.38
Improved No. 5.	2.75	
Jennings'	2.50	3.00
Millers' Falls		5.75
Snell's, Rice's Pat.	2.50	2.75
Swan's, No. 500	5.10	No. 200 6.45

Hoisting—
Moore's Anti-Friction Differential Pulley Block 30%
Moore's Hand Hoist, with Lock Brake. 20%
Moore's Portable Pneumatic Hoist 25%

Ice Cutting—
Chandler's 15%

Washing—
Wayne American ..... ₩ doz. $28.00
Western Star, No. 2 ..... ₩ doz. 28.00
Western Star, No. 3 ..... ₩ doz 30.00
St. Louis, No. 41 ..... ₩ doz. 60.00

Mallets—
Hickory ..... 45&5@50%
Lignumvitæ ..... 45&5@50%
Tinners', Hickory and Applewood, doz. ..... 50@55c

Mats— Door—
Elastic Steel (W.G. Co.) 10%

Mattocks—
See *Picks and Mattocks.*

Meat Cutters—
See *Cutters, Meat.*

Milk Cans— See *Cans, Milk*

Mills— Coffee—
Enterprise Mfg. Co. ..... 25@30%
National, list Jan. 1, '94 ..... 30%
Parker's Columbia and Victor ..... 50&10@60%
Parker's Box and Side ..... 50&10@60%
Swift, Lane Bros. 30%

Mincing Knives—
See *Knives, Mincing.*

Molasses Gates—
See *Gates, Molasses.*

Money Drawers—
See *Drawers, Money.*

Mowers Lawn—
Net prices are generally quoted.
Cheap ..... *all sizes, $1.30@1.95*
Good ..... *all sizes, $2.25@2.50*

	10	12	14	16-inch
High Grade	4.25	4.50	4.75	5.00

Continental ..... 60&10&5%
Great American ..... 70&5%
Great American Ball Bearing .. 60&10&5%
Quaker City ..... 70&5%
Pennsylvania ..... 60&10&5%
Pennsylvania Golf 50%
Pennsylvania Horse 40%
Pennsylvania Pony 45%
Philadelphia:
Style M., S., C., K., T. ..... 70&5%
Style A, all Steel ..... 60&10%
Style E, Low Wheel ..... 60&10%
Style E, High Wheel ..... 70&10&5%
Drexel and Gold Coin, low list.. 50&5%

Nails—
Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered.
List July 20, 1899 .85&10@85&10&10%
Hungarian, Finishing, Upholsterers, &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
A. C	.25¢	23¢	22¢	21¢	21¢	.40&5%
Ausable	.28¢	26¢	25¢	24¢	23¢	.50&10%
Capewell	.19¢	18¢	17¢	16¢	16¢	.10&5%
C. B. K.	.25¢	25¢	22¢	21¢	21¢	.40%
Champ'in	28¢	26¢	25¢	24¢	23¢	.40&10&5%
Clinton	.19¢	17¢	16¢	15¢	14¢	.30&10&5%
Maud S.	.25¢	23¢	22¢	21¢	21¢	.50%
Putnam	.23¢	21¢	20¢	19¢	18¢	.33⅓%
Vulcan	.23¢	21¢	20¢	19¢	18¢	.25&10%
American, Nos.						9@9¼¢
Neponset						.Nos. 5 to 10¢ ₩ ₥ 12¢
Jobbers' special brands						*..per lb. 8@9c*

Picture

	1½	2	2½	3	3½ in.
Brass Head	.45	.60	.70	.95	1.00 gro.
Por. Head	..	1.10	1.10	1.10	.. gro.

Nippers, See *Pliers and Nippers.*

Nut Crackers—
See *Crackers, Nut.*

Nuts—
Cold Punched: *Off list.*
Mfrs. or U. S. Standard.
Square, plain ..... *$5.00@5.10*
Hexagon, plain ..... *$5.30@5.40*
Square, C. T. & R. ..... *$5.20@5.30*
Hexagon, C. T. & R. ..... *$5.80@5.90*
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank ..... *$5.20@5.30*
Hexagon Blank ..... *$5.80@ .90*
Square Tapped ..... *$5.00@5.10*
Hexagon Tapped ..... *$5.60@5.70*

Oakum—
Best or Government ..... *lb. 6¼c*
Navy ..... *lb. 5 c*
U. S. Navy ..... *lb. 5¼c*
Plumbers' Spun Oakum *2¾c*
In carload lots ¼c lb. off f.o b. New York.

Oil Axle—
Snow Flake:
1 pt. cans, per doz. $3.00
1 qt. cans, per doz $4 80
1 gal. cans, per doz. $15 00
5 gal. cans, per doz. $66.00
} 33⅓&10%

Oil Tanks— See *Tanks, Oil.*

Oilers—
Brass and Copper ..... *40&10%*
Tin or Steel ..... *60&10%*
Zinc ..... *60&10%*
Paragon:
Brass and Copper ..... *40&10%*
Tin or Steel ..... *60&10%*
Zinc ..... *60&10%*
Malleable, Hammers' Improved, No. 1 $3.60; No. 2, $4; No. 3, $4.40 ₩ doz. 30%
Malleable, Hammers' Old Pattern, same list ..... 50&10%
Wilmot & Hobbs Mfg. Co:
Spring Bottom Cans ..... 70@70&10%
Railroad Oilers etc. ..... 60@60&10%

Openers— Can—
French ..... *doz. 35c*
Iron Handle ..... *doz. 25@27c*
Sprague, Iron Hdle..per doz 35@40c
Sardine Scissors...doz. $1.75@3.00
Tip Top ..... per doz. $0.75
National, ₩ gro. ..... $1.75@$2.00
Stowell's ..... per doz. 35@45¢
Waldorf, ₩ gro. $8.65

Egg—
Nickel Plate ..... per doz., $2.25
Silver Plate ..... per doz., $3.50

Packing—
Asbestos Packing, Wick and Rope, 15@15½c lb.

Rubber—
Sheet, C. I. ..... *8@12c*
Sheet, C. O. S. ..... *9@13c*
Sheet, C. B. S. ..... *10@14c*
Sheet, Pure Gum ..... *50@70c*
Sheet, Red ..... *35@40c*
Jenkins' Standard, ₩ ₥ 80¢ ..... **25@25&5%**

Miscellaneous—
American Packing ..... *7@10c lb.*
Cotton Packing ..... *13@14c lb.*
Italian Packing ..... *9@12½c lb.*
Jute ..... *3½@4c lb.*
Russia Packing ..... *7@11c lb.*

Pails— Creamery
S. S. & Co., with gauges.. No 1 $6.50; No. 2, $5.75 ₩ doz.

Galvanized—
Price per gro.

	Quart	*10*	*12*	*14*
Water, Regular	..	18.00	21.00	24.00
Water, Heavy	....	24.00	27.30	30.00
Fire, Rd. Bottom.		31.00	33.00	35.00
Well	....	27.00	29.00	31.00

Pans— Dripping—
Standard List. ..... *50@10@50&10%*

Fry—
Common Lipped:

No.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.60*	*.75*	*.85*	*.95*	*1.15*

Roasting and Baking—
Regal, S. S. & Co., ₩ doz., Nos. 5 $4.50; 10 $5.00; 20 $5.50; 30, $6.00
Simplex, ₩ gro., No. 40 $30.00; 50, $34.50; 60 $39 00; 140, $33.00; 150, $37.50; 160, $43.00.

Paper—Building Paper—

Asbestos:	*lb.*
Building Felt	*3c*
Mill Board, sheet, 40 x 40 inches	*4c*
Mill Board, roll, thicker than 1-16 inch	*3c*
Mill Board, roll, 1-16 in. thick and less	*3c*

	Per roll 500 sq. ft.
Rosin Sized Sheathing:	
Light wt. 20 lbs. to roll	*$1.32*
Medium wt., 30 lbs. to roll	*$0.47*
Heavy wt. 40 lbs. to roll	*$0.58*
Medium Grades Water Proof Sheathing	*$0.65@1.25*
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton	*$40.00@42.00*
Red Rope Roofing, 250 sq. feet per roll	*$1.65*

Tarred Paper.
1 ply (roll 500 sq.ft.), ton ..... *$28.00@30.00*
2 ply, roll 108 sq. ft. ..... *.60@.65c*
3 ply, roll 108 sq. ft. ..... *.80@.65c*
Slater's Felt (roll 500 sq. ft.)..*.50@.60c*
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.) $2.75

Sand and Emery—
List Dec. 25, 1899 ..... *.60@60&10%*

Parers— Apple—

Advance	₩ doz.	$4.50
Baldwin	₩ doz.	$5.00
Bonanza	each	$5.00
Dandy	each	$7.50
Eureka, 1898	each	$10.00
Family Bay State	₩ doz.	$12.00
Hudson's Little Star	₩ doz.	$4.00
Hudson's Rocking Table	₩ doz.	$5.50
Improved Bay State	₩ doz.	$27.00@30.00
New Lightning	₩ doz.	$5.50
Reading 72	₩ doz.	$4.00
Reading 78	₩ doz.	$7.00
Turn Table '98	₩ doz.	$5.50
White Mountain	₩ doz.	$4.00

Potato—

Saratoga	₩ doz.	$5.50
White Mountain	₩ doz.	$4.50

Paris Green— per lb.
Arsenic keys or casks ..... *11 @11½c*
Kegs, 100 to 175 lbs ..... *11½@12 c*
Kits, 14, 28, 56 lbs ..... *12½@13 c*
Paper boxes, 2 to 5 lbs ..... *12½@13 c*
Paper boxes, 1 lb ..... *13 @13½c*
Paper boxes, ½ lb ..... *14 @14½c*
Paper boxes, ¼ lb ..... *15 @15½c*

Picks and Mattocks—
List Feb. 25, 1899 ..... *70@70c10%*

Pigeons - Clay
Markle's Black Birds, f.o b. factory, per M. $3.75
See also *Traps, Target.*

Pinking Irons—
See *Irons, Pinking.*

Pins— Escutcheon—
Brass *60%*
Iron, list Nov 11, '85 ..... *60%*

Pipe, Cast Iron Soil—
Standard, 2-5 in. ..... *60@7½%*
Extra Heavy, 2-6 in. *70%*
Fittings ..... *75@5%*

Pipe, Merchant, Boiler Tubes, &c.—

Merchant Pipe.	*Black.*	*Galvanized*
⅛ to ½ inch	61%	48%
¾ to 10 inch	68½%	56%
Boiler Tubes	*Up to*	
Steel.	*22 feet*	
1 to 1¼ inch and 2¾ to 5 inch inclusive		65½%
2 to 2½ inch, inclusive		60%
6 to 10 inches		59%
Iron.		50%
1 to 1½ inch and 2½ in.		43½%
1¾ to 2¼ inch		45%
2¾ to 12 inch		50%
Casing, Cut Lengths.	*S. & S.*	
2 to 3 inch		53½%
3¼ to 4 inch		55%
4¼ to 12½ inch		61½%

Pipe Sewer
Standard Pipe and Fittings, 2 to 24 in. New England 70%
New York and New Jersey 73%
Ohio and Michigan 8%
Carload lots are generally delivered.

Planes and Plane Irons—
Wood Planes—
Moldinn ..... *40 @2½@40&10%*
Bench, First quality 45&10@45&10&5%
Bench, Second qual..50&10@50&10&5%
Bailey's (Stanley R. & L. Co) 25&10@25&10&10%
Gage Self Setting 35%

Iron Planes—
Bailey's (Stanley R. & L. Co) ..... 25&10@25&10&10%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 25&10@25&10&10%
Sargent's ..... 50&10&10%

Plane Irons—
Wood Bench Plane Irons ..... *50&5@50&10&5%*
Buck Bros. 30%
Stanley R. & L. Co... 30&10@30&10&10%
L. & L. J. White ..... 20&5@25%

Planters, Corn, Hand.
Kohler's Eclipse ..... ₩ doz. $9.00

Plates—
Felloe ..... *lb. 3¾@4c*
Self-Sealing Pie Plates (S. S. & Co.), ₩ doz. $2.00 ..... 50%

Pliers and Nippers—
Button Pliers ..... *70@10@75%*
Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45
Gas Pipe.. 7 8 10 12-in.
$1.75 $2.00 $2.75 $3.75
Acme Nippers ..... 50@50&5%
Bernard's:
Parallel Pliers, &c. 45%
Paragon Pliers ..... 50&5%
Lodi Pliers ..... 30&5%
Elm City Fence Pliers 35%
Crouse Hanger Co.:
American Button ..... 75&10%
Cronk's 60%
Improved Button ..... 70&10%
Stub's Pattern 50%
Combination and others 25%
Heller's Farriers' Nippers, Pincers and Tools 50&30&5%
P., S. & W. Tinners' Cutting Nippers, 30@.90&10%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—
Plumbs and Levels ..... *75@75&10%*
Davis Iron, Machinist Nos. 1 to 14 ..... 30%
Davis Iron, Adjustable Nos. 6 to 49 ..... 35%
Disston's 70%
Pocket Levels ..... 75&10&10@75&10%
Stanley R. & L. Co ..... 40@10&10&10%
Stanley's Duplex ..... 20@20&10&10%
Woods' Extension 35%

Poachers, Egg—
Buffalo Steam Egg Poachers, ₩ doz. No. 1, $7.20; No. 2, $11.00 No. 3, $11.00; No. 4, $14.50 ..... 50%

Points, Glaziers'—
Bulk and 1 lb. papers ..... *lb. 8 c@..*
¼-lb. papers ..... *lb. 8½c@..*
¼-lb. papers ..... *lb. 9 c@..*

Pokes, Animal—
Ft. Madison Hawkeye ..... ₩ doz. $3.25
Ft. Madison, Western ..... ₩ doz. $3.75

Police Goods—
Manufacturers' Lists ..... *25@25&5%*
Tower's 25%

Polish—Metal—
Prestoline Liquid, No. 1 (½ pt.), ₩ doz. $3.00; No. 2 (1 qt.), $9.75 ..... 40%
Prestoline Paste ..... 40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gr. $4.50; ½ ₥ boxes, ₩ doz. $1.25; 1 ₥ boxes, ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz. $1.25; ₩ gr. $12.00.
Barkeepers' Friend Metal Polish, ₩ doz. $1.75; ₩ gr. $18.00.
Wynn's White Silk, ¼ pt. cans, ₩ doz. $2.00

Stove—
Black Eagle Benzine Paste, 5 ₥ cans .. ₩ ₥ 10¢
Black Eagle, Liquid, ½ pt. cans ..... ₩ doz. 75¢
Black Jack Paste, ¾ ₥ cans, ₩ gro. $9.00
Ladd's Black Beauty, gr. $10.00 ..... 50%
Joseph Dixon's, ₩ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₩ ₥ 8¢
Fireside ..... ₩ gr. $2.50
Gem, ₩ gr. $4.50 ..... 10%
Japanese ..... ₩ gr. $3.00
Jet Black ..... ₩ gr. $3.50
Peerless Iron Enamel, ¼ pt. cans ..... ₩ doz. $1.50
Wynn's:
Black Silk, 5 ₥ pail ..... each 70¢
Black Silk, ½ ₥ box ..... ₩ doz. $1.00
Black Silk, 5 oz. box ..... ₩ doz. $0.75
Black Silk, ½ pt. liq ..... ₩ doz. $1.00

Poppers, Corn—
Round or Square:
1 qt ..... *gro. $7.00@ 87.50*
1½ qt ..... *gro. 9 50@ 10 00*
2 qt ..... *gro. 10.50@ 11.00*

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Potato Parers—
See *Parers, Potato.*

Pots— Glue—
Enameled *15%*
Tinned *50%*

Powder—
In Canisters:
Duck, 1 lb. each *45c*
Fine Sporting, 1 lb. each *75c*
Rifle, ½-lb. each *15c*
Rifle, 1-lb. each *25c*
In Kegs:
Duck, 6½-lb. kegs *$2.25*
Duck, 12½-lb. kegs *$4.25*
Duck, 25-lb kegs *$8.00*
Rifle, 6¼-lb kegs *$1.25*
Rifle, 12½-lb. kegs *$2 25*
Rifle, 25-lb. kegs *$4.00*
King's Semi-Smokeless:
Keg (25 ₥ bulk) $8 50
Half Keg (12½ ₥ bulk) $3.50
Quarter Keg (6¼ ₥ bulk) $1.90
Case 24 (1 ₥ cans bulk) $8.50
Half case 12 (1 ₥ cans bulk) $4 50

King's Smokeless:	Shot Gun	Rifle
Keg (25 ₥ bulk)	$13 00	$15.00
Half Keg (12½ ₥ bulk)	6.25	7.75
Quarter Keg (6¼ ₥ bulk)	3.25	4 00
Case 24 (1 ₥ cans bulk)	14.00	17 00
Half case 12 (1 ₥ cans blk)	7.25	8 75

Presses— Fruit and Jelly—
Enterprise Mfg. Co. ..... 20@25%
Seal Presses:
Morrill's No. 1, per doz. $20 00 ..... 50%
Morrill's No 2, per doz. $22 50 ..... 50%

Pruning Hooks and Shears— See *Shears.*

Pullers, Nail—
Cyclops ..... 40@40&10%
Miller's Falls, No. 3, per doz. $13.00 ..... 15&10%
Pearson No. 1, Cyclone Spike Puller each $30.00 ..... 50%
Pelican, ₩ doz. $9.00 ..... 40&10%
Samson ..... ₩ doz. $18.00
Scranton, Case Lots:
No. 1 (large), ₩ doz. $6.50; No. 2 (large), $5.75; No 3 (small), $5.00; No. 2-B (large), $5.50; No. 3-B (small), $4.00; No. 2-D (large), $4 50; No 3-D (small) $4.00.
Smith & Hemenway Co.:
Diamond B, No. 2, case lots. ₩ doz $6.00
Diamond B, No. 3, case lots. ₩ doz $5.50
Giant, No. 1, ₩ doz. $18; No. 2, $16.50; No. 3, $15 ..... 40%

Pulleys—Single Wheel—

Inch	*2*	*2½*	*3*
Awning ..doz.	*$0.45*	*.70*	*.95*
Inch	*2*	*2¼*	*2½*
Hay Fork, Swivel or Solid Eye		*doz.*	*$1.35@1.50*
Hot House..doz	*$0.65*	*.90*	*1.20*
Inch	*1¼*	*1½*	*1¾*	*2*
Screw....doz.	*$0.15*	*.20*	*.25*	*.30*
Inch	*1¾*	*2*	*2¼*	*2½*
Side.....doz.	*$0.30*	*.40*	*.55*	*.60*
Inch	*1½*	*1¾*	*2*	*2½*
Tackle...doz.	*$0.50*	*.45*	*.65*	*1.10*

Stowell's:
Ceiling or End, Anti-Friction 60%
Dumb Waiter, Anti-Friction ..... 60&10%
Hay Fork, Anti-Friction, 5-in. Wheel, ₩ doz. $12.00 ..... 50%
Electric Light 60%
Side, Anti-Friction ..... 60&10%

Sash Pulleys—
Common Frame; Square or Round End per doz., 1¾ in., 13c; 2 in., 16c
Auger Mortise, no Face Plate, per doz. 1¾ in., 12c.; 2 in., 15c.
Auger Mortise, with Face Plate, per doz., 1¾ in., 13c.; 2 in., 15½c.

Acme.....1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in.... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2¼ in.....
₱ doz. 25¢
No. 9, 1¾ in.....₱ doz. 20¢
Extra for Plated Finish...₱ doz. 20¢
Extra for Anti-Friction Bronze Bushing.....₱ doz. 10¢
Grand Rapids All Steel Noiseless....40%
Ideal No. 13.....1¾ in., ₱ doz., 16¢
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 20, Troy....1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern.....60@60&10%
Pitcher Spout.....75@75&10%
Wood.....50@50&10%
Pump Leathers, Lower and Plunger Valves—Per gro.:

Inch..	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch..	3	3¼	3½	3¾	4
	$3.30	3.60	3.85	4.10	4.40

Barnes Dbl. Acting (low list).....50%
Flint & Walling's Fast Mail (low list).50%
Flint & Walling's Pitcher Spout.....75%
Loud's Suction Pumps, U. S. Co.....20%
Myer's Pumps, low list.....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50&10%
Contractors' Rubber Diaphragm Non-chokable, B. & L. Block Co.....30%

Punches—

Revolving (4 tubes)...doz. $3.75@4.25
Saddlers' or Drive, good..doz 65@70c
Spring, single tube, good quality...
$1.65@1.75
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Bemis & Call Co.'s Spring.....50%
Morrill's No. 1 (A.B.C.), ₱ doz., $15.00..5%
No. 2, ₱ doz. $22.50.....5%
No. 2, Metal, ₱ doz., $15.00.....5%
Bench Punch, each, $9.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Steel Screw, B. & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co.....
35@3 &5%
Tinners' Solid, P., S. & W.Co., ₱ doz., $1.44.....60%

Rail— Barn Door, &c.—

Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:

⅛	¾	¾	*In.*
$1.70	$2.10	$5.00	*100 feet.*

Angular for Sq. Groove Wheels:

Small.	*Med.*	*Large.*	
$1.60	1.95	2.70	*100 feet.*

Sliding Door, Brnzed Wr't Iron, f. ⅛¢
Sliding Door, Iron Painted....⅛@3c
Sliding Door, Wrought Brass. 1½ in..... lb. 36c. 30%
Cronk's Double Braced Steel Rail, ₱ foot.....3½¢
Cronk's O. N. T. Rail.....3¼¢
Lanes' O. N. T., ₱ 100 ft., 1 inch...$2.85
Lanes' Standard, ₱ 100 ft.....3.75
Lawrence Bros.' ₱ ft. 4½¢
McKinney's None Better.....₱ ft. 3½¢
McKinney's Standard.....₱ ft. 4 ¢
Stowell's Cast Rail.....1½¢
Stowell's Steel Rail, Plain.....25%
Stowell's Wrought Bracket, Plain....3½¢

Rakes—

Net Prices, Malleable Rakes:

10	12	14	*16-tooth*
Shank.....$1.50	1.60	1.75	1.85
Socket....$1.65	1.90	1.95	2.10

Sept. 1, 1900, List:
Cast Steel.....70¢&c&2%
Malleable.....70¢@70¢&5%
Lawn Rakes, Metal Head, per doz.
20 teeth.....$3.25@3.50
24 teeth.....$3.60@3.75
Fort Madison Red Head Lawn.....$3 25
Fort Madison Blue Head Lawn.....$3.00
Jackson Lawn, 29 and 30 teeth.....
₱ doz. $4.00
Kobler's:
Lawn Queen, 20-tooth, ₱ doz.....$3.60
Lawn Queen, 24-tooth, ₱ doz.....$3.75
Paragon, 20-tooth, ₱ doz.....$2.85
Paragon, 24-tooth, ₱ doz.....$3.00
Steel Garden, 14-tooth, ₱ doz.....$3.00
Malleable Garden, 14-tooth ₱ doz. $2.25

Rasps, Horse—

Disston's.....75%
Heller Bros.....70&5%
McCaffrey File Co Horse Rsps.60&10&5%
New Nicholson Horse Rasp.....70&10%
See also *Files.*

Razors—

Boracle.....70%
Fox Razors, No. 42...₱ doz. $36.00
Fox Razors, No. 44...₱ doz $24.00
Fox Razors, No. 82, Platina, ₱ doz $24.00
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%
Safety Razors.....40%

Razor Strops—

See *Strops, Razor.*

Reels— Fishing—

Hendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Populo and Salmon, Single Action, Multiplying and Quadruple, all sizes.....25%
Hendryx Single Action Series, 102P and PN, 202P and PN, 102 PR and PRN, 202 PR and PRN, 304 P and PN, 00304P and PN, 502 and 502N, 802 and 802N, 02084N, Competitor.50%
Hendryx Multiplying and Quadruple Series, 3004N and PN, 42 and PN, 3904N, 3904P and PN, 00290C PN, 0924 and 0924N, 5009N and PN.....40&10%
Shakespeare, Style C.....25%

Registers—

List Sept. 2, 1901.

Black Jap
White Jap
Bronzed
Nickel Plated
Electro Plated
} 6¢&10&5 @ 70¢&5%

There is a good deal of irregularity in prices of Registers, especially in Black Japanned, and some jobbers and manufacturers are using the old list.

Revolvers—

Single Action.....85@90c
Double Action, except 44 calibers..$1.50
Double Action, 44 calibers.....$1 65
Automatic *$4.10*
Hammerless.....$7.00

Riddles, Grain or Sand—

16 in. per doz.....$2.00@$2.25
17 in. per doz.....$2.25@$2.50
18 in. per doz.....$2.50@$2 75

Rings and Ringers—

Bull Rings—

	2	2½	3 *Inch.*
Steel.....	$0 80	0.90	0.95 *doz.*
Copper.....	1.10	1.30	1.50 *doz.*

Hog Rings and Ringers—

Hill's Rings....gro. boxes, $4.00@4.50
Hill's Ringers, Gray Iron. doz. 50@55c
Hill's Ringers, Mal. Iron, doz. 75@80c
Blair's Rings.....*per gro. $5.75@6.00*
Blair's Ringers...per doz. 60.65@ .70
Brown's Rings....per gro. $6.00@6.25
Brown's Ringers...per doz. $1.00@1.10
Rapid Rings.....₱ gro. $6.00
Rapid Ringers.....₱ doz. $3.50

Rivets and Burrs—

Copper.....50¢&10@50¢&10¢&5%
Iron or Steel:
Tinners'.....70@70¢&10%
Miscellaneous.....70@70¢&10%

Rivet Sets—See *Sets*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....50&10&10%
Cronk's Stay.....60%
Cronk's Brinkerhoff.....60%
Lane's, Stay.....33⅓%
Stowell's Barn Door Stay...₱ doz. $1.25

Rope—

Manila, 7-16 in. and larger
lb. 12½@13 c
Manila.....¾-inch.....lb. 13 @13½c
Manila ¼ & 5-16 in.....lb. 13½@14 c
Manila, Tarred Rope,
15 thread.....*lb. 12½@13 c*
Manila Hay Rope.
Medium.....*lb. 12½@13 c*
Sisal, 7-16 in. and larger lb. 8 @9¼c
Sisal.....*¾-inch..lb. 9¼@ 9¾c*
Sisal ½ and 5-16 in.....lb. 9¾@10¼c
Sisal, Hay Rope, 2 to 10
ply.....*lb. 9 @ 9½c*
Sisal, Tarred, Medium
Lath Yarn.....*lb. 8½@ 8¾c*
Cotton Rope:
Best...¼-in. and larger lb. 13½c
Medium...¼-in. and larger lb. 11 c
Com.....¼-in. and larger lb. 9 c
Jute Rope:
Thread No. 1, ⅛ in. and up lb. 6½c
Thread No. 2, ¼-in. and up lb. 6 c
Yarn, ⅛ in and up.....*lb. 5 c*

Wire Rope—

Galvanized.....25&2½%
Plain.....30&2½%

Ropes, Hammock

Covert Mfg. Co.....45&2%
Covert Saddlery Works.....40&5%

Rules—

Boxwood.....60@65&10%
Ivory.....35&10@35&10&10%
Chapin-Stephens Co.:
Boxwood.....60@60&10%
Ivory.....35&10@35&10&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....50&10%
Stanley R. & L. Co.:
Boxwood.....60@60&10%
Ivory.....35&10@35&10&10%
Upson Nut Co.:
Boxwood.....60@60&10%
Ivory.....35&10@35&10&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—

See *Paper and Cloth.*

Sash Cords—See *Cord, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers Sausage.*

Saw Frames—See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins:
Circular.....50@50&10%
Band.....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50&10%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Disston's:
Circular Solid and Inserted Tooth.50%
Band 2 to 14 in. wide.....60%
Band ¼ to 1¼.....70%
Crosscuts.....4.50@45&10%
Narrow Crosscuts.....50@50&10%
Mulay, Mill and Drag.....50&10%
Framed Woodsaws.....33@35&7½%
Wo dsaw Blades.....40@40&7½%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 10, d100, D8, 120, 7½, 77, 8.....25@25&7½%
Hand Saws, Nos 7, 07, 10, 3, 1, 0, 00, Combination.....30@30&7½%
Compass, Keyhole, &c.....25@25&7½%
Batch r Saws and Blades..35@35&7½%
C. E. Jennings & Co.'s:
Back Saws.....25%
Butcher Saws.....35%
Compass and Key Hole Saws.....25%
Framed Wood Saws.....40%
Hand Saws.....25@30%
Wood Saw Blades.....45%
Peace:
Circular and Mill.....50%
Cross Cuts, list Jan. 1, '99.....50%
Hand, Panel and Rip.....30%
Richard on:
Circular and Mill.....50%
Hand, &c.....30%
X Cuts, list Jan. 1, '99.....50%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Compass, Keyhole, &c.....25@25&7½%
Wood Saws.....35@35&7½%

Hack Saws—

Disston:
Concave Blades.....25%
Keystone.....30%
Hack Saw Frames.....30%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180, 330.....40%
Hack Saws, Nos. 175, 180, 330, complete.....40%
Griffin's Hack Saw Frames 45%
Griffin's Hack Saw Blades.....45%
Star Hack Saws and Blades.....15&10%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....30%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scale Beams—

See *Beams, Scale.*

Scales—

Family, Turnbull's.....30@30&10%
Counter:
Hatch. Platform, ¼ oz to 8 lbs. doz $5.50
Two Platforms, ½ oz to 8 lbs. doz. $10
Union Platform, Plain..$1.70@1.90
Union Platform, Striped $1.85@2.15
Chatillon's:
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Pelouze Scales—Household, Counter, Confectioners', Postal, Ice, &c.....60%
"The Standard" Portables.....45%
"The Standard" R. R. and Wagon.....50%

Scrapers—

Box, 1 Handle.....*doz $2.25@2.50*
Box, 2 Handle.....*doz. $3.75@4.00*
Ship, No. 1, doz $3 50; No. 2, $2 25@2.40
Adjustable Box Scraper (S. R. & L. Co.) $8.00.....30@30&10%

Screens, Window, and Frames—

Bonanza Window Screens.....60&10&5%
Copland Victor Screens.....60&10&5%
Five Pattern Windo v Screen..60&10&5%
Maine Window Screen Frames 40&10&5%
Perfection Window Screens.....60@60&5%
Phillips' Window Screen Frames.....60&10&5%
Porter's Hummer Window Screens.....60&10&5%
Porter's Klondike Window Screens.....60&10&5%
Wabash Spring Adj. Screen.....50%
See also *Doors.*

Screw Drivers—

See *Drivers, Screw.*

Screws—Bench and Hand—

Bench, Iron, doz. 1 in., $3.00@3.25; 1¼, $3.50@3.75; 1½, $4.00@4.50
Bench, Wood, Beech..doz. $3.50@3.75
Hand, Wood.....*30@5@50%*
Hand, R. Bliss Mfg. Co.....35%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, '99.....*75@5@...%*
Coach and Lag, Gimlet Point, list Oct. 1, '99.....*75@...%*
Hand Rail, list Jan. 1, '81.60@10@...%

Jack Screws—

Standard List.....75@75&10%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50&50&3%
Sargent.....70&10%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.50@50&10%
Flat or Round Head, Brass50@50&10%

Set and Cap—

Set (Iron or Steel).....70¢&10¢&10%
Sq. Hd. Cap.....65¢&10¢&10%
Hex. Hd. Cap.....65¢&10¢&10%
Rd. or Fillister Hd. Cap..60 &10¢&10%

Wood—

List Jan. 1, 1900.
Manufacturers' printed discounts:
Flat Head, Iron.....87½@90%
Round Head, Iron.....85@87½%
Flat Head, Brass.....85@87½%
Round Head, Brass.....82½@85%
Flat Head, Bronze.....75@80%
Round Head, Bronze.....73½@77½%
Drive Screws.....87½@90%
NOTE.—*Extra 5@10% often given*

Scroll Saws—See *Saws, Scroll*

Scythes— *Per doz.*

Clipper Pattern, Grass.....$4.25
Full Polished Clipper.....$4.75
Grain.....$7.00
Clipper, Grain.....$7.50
Wood and Bush.....$4.50

Scythe Snaths—

See *Snaths, Scythe.*

Seeders— Raisin—

Enterprise.....25@30%

Sets— Awl and Tool—

Brad Awl and Tool Sets:
Wood Hdle., 10 Awls doz. $2.00@2 25
Wood Hdle., 14 Awls, 6 Tools.... doz. $2.50@2.80
Aiken's Sets, Awl and Tools:
No. 20, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool Hdle., Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
Millers Falls Adj. Tool Hdle, No. 1, $12; No. 4, $12; No. 5, $18.....15&10%
Stanley's Excelsior:
No. 1, $7.50; No. 2 $4.00; No. 3, $5.50.....30&50&10&10%

Garden Tool Sets—

Ft. Madison Rakes, Shovel and Hoe.....
₱ doz.....$9.00

Nail—

Square.....*per gro. $3.50*
Round, Blk. and Pol., assorted.....
gro. $1.80@2.00
Octagon.....*gro. $4.25@4.75*
Knurled, Good.....*gro. $5.00@5.50*
Buck Brothers.....27½%
Cannon's Diamond Point, ₱ gr. $12..25%
Mayhew's.....per gro. $9.00
Snell's Corrugated, Cup Pt. per gro. $7.50
Snell's Knurled, Cup Pt....per gro $7.50

Rivet—

Regular list.....70@70¢&10¢&5%

Saw—

Aiken's:
Genuine.....₱ doz. $5.50@6.00
Imitation.....₱ doz. $3.00@3.10
Atkin's.:
Criterion.....40%
Adjustable.....40%
Bemis & Call Co's.:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....20%
Spring Hammer.....40%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.63.....50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 9½, $15.63.....50%
No. 1 Old Style, $10.00.....50%
Taintor Positive, ₱ doz. $18.....60%

Sharpeners Knife—

Chicago Wheel & Mfg. Co.....65%
Smith & Hemenway Co.....70&5%
Tanite Mills ₱ gross, $14.40.....25@33⅓%

Sharpeners Skate—

Eureka Skate Sharpener.....₱ doz. $2.00

Shaves, Spoke—

Iron.....*doz. $1.00@1 25*
Wood.....*doz. $1.75@2.00*
Bailey's (Stanley R. & L. Co.).....
50@50&10&10%
Goodell's, ₱ doz. $9.00.....15&10%

Shears—

Cast Iron...	7	8	9 *in.*
Best.....$16.00	18.00	20.00	*gro.*
Good.....$13.00	15.00	17.00	*gro.*
Cheap.....$ 5.00	6.00	7.00	*gro.*

Straight Trimmers, &c.:
Best quality, Jan.....*70@70&10%*
" *Nickel*.....*60@60&10%*
Fair qual. Jan.....*80@80&5%*
" *Nickel*.....*75@75&5%*
Tailors' Shears.....*40@40&10%*
Acme Cast Shears.....40@40&5%
Heinisch's Tailors' Shears.....40%
Wilkinson's Hedge.....50%
Wilkinson's Sheep.....1900 list. 50%

Tinners' Snips—

Steel Blades.....*20¢&10%*
Steel Laid Blades.....*10¢&10%*
Forged Handles, Steel Blades, Berlin.....10&10&10%
Jennings & Griffin Mfg. Co's. 7 to 10 inch.....50%
Niagara Snips.....40%
P. S. & W. Co.....20%

Pruning Shears and Tools—

Cronk's Grape Shears.....33⅓¢
Cronk's Pruning Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25@25&10%
Disston's Pruning Hook, ₱ doz. $12.00 .....25@25&10%
John T. Henry Mfg. Company:
Pruning Shears, all grades.....40@40&5%
Orange Shears.....50&10@50&20%
Grape.....40&10@50%
Tree Pruners.....75%
Nagley's Pruning Shears.....10&5%
P., S. & W. Co.....33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction.....50%
Patent Roller Hatfield's, Sargent's list, 75&10&10%
Reading.....70&10@75%
R. & E. list.....33⅓%
Wrightsville, Hatfield Pattern.....80%

Sliding Shutter—

Reading list.....70&10@75%
R. & E. list.....33⅓%
Sargent's list.....50&10&5&10%

Shells— Shells, Empty—

Brass Shells, Empty:
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge.....65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Sunbeam, 10, 12, 16 and 20 gauge.....33⅓&10%
Blue Rival, New Climax, Primrose Club, Yellow Rival, 10, 12, 16 and 20 gauge.....15%
Climax Club, League, Rival, 14, 16 and 20 gauge ($7.50 list).....20&5%
Climax Club, League, Rival 10 and 12 gauge.....25&5%
Defiance, High Base, New Victor, Nitro, Repeater, 10, 12, 16 and 20 gauge.....15%
Trap and Metal Lined, 10, 12, 16 and 20 gauge.....33⅓&10&5%

Shells, Loaded—

Loaded with Black Powder.....*40&5%*
Loaded with Smokeless Powder, medium grade.....*40¢10&5%*
Loaded with Smokeless Powder, high grade.....*40¢10¢10&5%*

Shoes, Horse, Mule, &c.—

F. o. b., Pittsburg.
Iron.....*per keg $3.60*
Steel.....*per keg 3.35*
Barden's, all sizes, ₱ keg.....$3 60

Shot—

Drop, up to B, 25-lb. bag.....*$1.35*
Drop, B and larger, per 25-lb. bag.....
$1.50
Buck, 25 lb. bag.....*$1.40*
Chilled, 25 lb. bag.....*$1.50*
Dust Shot, 25-lb. bag.....*$1.10*
Markle's Chilled.....$1.60
Ramson Chilled.....$1.60

Shovels and Spades—

Assorted in list.....*40%*
Note.—Common Plain Back Shovels are generally sold by jobbers at $6.75@7.00.

Sieves and Sifters—

Hunter's Imitation gro. $11.00@11.50
Buffalo Metallic Blued, S. S. & Co., ₱ gr.:
14&16 16&18 18&20
$12.90 $13.80 $15.00
F. J. Meyers' Mfg. Co.:
Eclipse ₱ gr. $11.06
Electric Light ₱ gr. $11.00
Hunter's Genuine ₱ gr. $12.50
No Name, Hunter's ₱ gr. $11.00
Standard ₱ gr. $11.00
Shaker (Barler's Pat.) Flour Sifters.. ₱ doz., $2.00 ..30%

Sieves, Tin Rim—

Per dozen.

Mesh	14	16	18	20
Black, full size	$0.95	.98	1.00	1.10
Plated, full size	$1.05	1.08	1.10	1.20
Black, scant	$0.78	.80	.83	

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested, doz.....$0.65@0.75
Mesh 20, Nested, doz..... .75@ .85
Mesh 24, Nested, doz..... .90@1.00

Sinks—

Cast Iron—

Standard list.....65&10@70..%
NOTE.—*There is not entire uniformity lists used by jobbers.*

Wrought Steel—

New Era, Galv'd and Enameled...70&5%
New Era, Painted.....60&10%
L. & G. Mfg. Co., Galvanized.....50%
L. & G. Mfg. Co. Enameled.....50%

Skeins, Wagon—

Cast Iron.....70c&10@75%
Malleable Iron.....40c&10@50%
Steel.....40@40&10%

Slates—

Factory Shipments.
"D" Slates..... 50c&10c&10c&10%
Unexcelled, etc., Noiseless Slates..60c & 8 tens %
Victoria, etc., Noiseless Slates..60c& 7 tens c&5%
Wire Bound.....50c&10c&5%
Web Hinge.....50%

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling $2.00.....33⅓

Snaps, Harness—

German.....40@40c&10%
Covert Mfg. Co.:
Derby.....35&2%
High Grade.....45&2%
Jockey.....40&2%
Trojan.....45&2%
Yankee.....35&2%
Yankee, Roller.....30&2%
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60%
Triumph.....60%
W. & E. T. Fitch Co.:
Bristol.....40&10%
Empire.....50&5%
German.....40%
National.....50&5%
Perfect.....40%
Clipper.....50&5%
Champion.....40%
Security.....40%
Victor.....60&5%
Oneida Community:
Solid Steel.....65@65&10%
Solid Swivel.....65&10@65&10&10%
Sargent's Patent Guarded.....60%&10%

Snaths—

Scythe.....50@50&10%

Snips, Tinners'—See *Shears.*

Soldering Irons—

See *Irons, Soldering.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Silver Plated—

Good Quality.....50c&10@60c&10c&5%
Cheap.....60@60c&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton.....40&10%
Rogers & Bro., William Rogers Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 7 Silver Plated Ware.....60&10%

Miscellaneous—

German Silver.....60c&10@60c&10c&10%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list 1 &10%

Tinned Iron—

Teas.....per gro. 45@5.0c
Tables..... per gro. 90c@1.00

Springs—

Door—

Gem (Coil).....20%
Star (Coil).....30%
Torrey's Rod, 30 in....₱ doz. $1.10@1.25
Victor (Coil).....50&10&10%

Carriage, Wagon, &c.

1¼ in. and Wider:
Black or ⅛ Bright, lb.....4¼c
Bright, lb.....5¼c
Painted Seat Springs:
1¼ x2x 26 and smaller, per pr 48@53c
1¼ x 2 x 28 per pr..... 56@61c
1¼ x 3 x 28 and narrower, per pr. 75@80c
Cliff's Springs:
Bolster.....40%
Seat.....per pair, 50¢
Pole..per pair, ⅝ in. $1.10; ¾ in. $1.25

Sprinklers, Lawn—

Enterprise.....25@30%
Philadelphia, No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....30%

Squares—

Nickel plated.... } *List Jan. 5, 1900*
Steel and Iron.... } .....70c&10@75%
Rosewood Hdl Try Square and T-Bevels.....60c&10c&10@70%
Iron Hdl. Try Squares and T-Bevels, 40c&10@40c&10c&10%
Disston's Try Sq. and T-Bevels.....60&10%
Winterbottom's Try and Miter..... 40&10@40&10&10%

Squeezers—

Lemon—

Wood, Common, gro., No. 0, $5.85 @$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap.....doz. $2.00@2.75
Good Grade.....doz. $3.00@3.50
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined doz. $2.00@3.25
Jennings' Star.....₱ doz. $1.85@1.90

Staples—

Barbed Blind.....lb. 6@9½c
Electricians', Association list..... 80c&10&10&10%
Fence Staples, same price as Barbed Wire. See Trade Report.
Poultry Netting, Staples....per lb.. 3¼@3½c
Grand Crossing Tack Co.'s list....80&10%

Steels, Butchers'—

Dick's.....30%
Foster Bros'.....30%
Hartzell Cutlery Co.....40&5%
C. & A. Hoffmann's.....40%

Steelyards.....25@25&10%

Stocks and Dies—

Blacksmiths'.....40@40&10%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25&30%
Curtis Reversible Ratchet Die Stock.25%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $8.00 per gro., 12 inch, $10.80
Pike Mfg. Co. 1901 list:

Black Diamond S. S....	₱ gro.	$12.00
Lamoille S. S....	₱ gro.	$11.00
White Mountain S. S....	₱ gro.	$9.00
Green Mountain S. S....	₱ gro.	$6.00
Extra Indian Pond S. S.	₱ gro.	$7.50
No. 1 Indian Pond S. S..	₱ gro.	$7.00
No. 2 Indian Pond S. S..	₱ gro.	$4.50
Leader Red End S. S....	₱ gro	$4.50
Balance of 1901 list 33⅓%		

Oil Stones, &c.

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit.....50%
Gem Corundum Axe, Single or Double Grit.....55%
Gem Corundum Slips.....55%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co. 1901 list:

Arkansas Stone, No. 1, 3 to 5 in.	₱ doz.	$2.80
Arkansas Stone, No. 1, 5½ to 8 in.	₱ doz.	$3.50
Arkansas Slips No. 1....		$4.00
Lily White Washita 4 to 8 in....		60¢
Rosy Red Washita 4 to 8 in....		60¢
Washita Stone, Extra, 4 to 8 in..		50¢
Washita Stone, No. 1, 4 to 8 in..		40¢
Washita Stone, No. 2, 4 to 8 in..		30¢
Lily White Slips....		90¢
Rosy Red Slips....		90¢
Washita Slips, Extra....		80¢
Washita Slips, No. 1....		70¢

25%
India Oil Stones (entire list).....25%
Hindostan No. 1, Regular.... ₱ lb 8¢
Hindostan No. 18 mall..... ₱ lb 10¢
33⅓%
Axe Stones (all kinds).....33⅓%
Turkey Oil Stones, ex. 5 to 8 in. ₱ lb 30¢
Queer Creek Stones, 4 to 8 in.....30¢
Queer Creek Slips.....40¢
Sand Stone.....5¢.....40%
Belgian, German and Swaty Razor Hones.....40%
Natural Grit Carving Knife Hones, ₱ doz.....$3.00
Quick Edge Pocket Knife Hones, ₱ doz.....$3.00
Mounted Kitchen Sand Stone, ₱ doz.....$1.50
33⅓%
Tanite Mills:
Emery Oil, ₱ doz. $5.00.....50@60%

Stoners—

Cherry—

Enterprise.....25@30%

Stops, Bench—

Millers Falls.....15&10%
Morrill's...₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Stops, Window—

Ives' Patent.....25&5%

Stove Boards—

See *Boards, Stove.*

Stove Polish—See *Polish, Stove.*

Strainers, Pump—

Diamond Joe Pump Strainers..per doz. 75¢

Straps, Box—

Cary's Universal, case lots.....20&10%

Stretchers, Carpet—

Cast Iron, Steel Points....doz. 55@65c
Socket.....doz. $1.75

Strops, Razor—

Smith & Hemenway Co.....70%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....30%

Tacks Brads, &c.—

List Jan. 15, '99.
Carpet Tacks, American 90c&25@....%
American Cut Tacks....90c&20@....%
Swedes Iron Tacks....90c&30@....%
Swedes Upholsterers' Tacks..... 90c&10@....%
Gimp Tacks.....90c&50@....%
Lace Tacks.....90c&40@....%
Trimmers' Tacks.....90c&25@....%
Looking Glass Tacks.....70c&10%
Bill Posters' and Railroad Tack.... 90c&10@....%
Hungarian Nails.....80c&15%
Common and Patent Brads....80c&10%
Trunk and Clout Nails.....80c&5%

NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights** and an extra 10&2½% on Standard Weights.****

Miscellaneous—

Double Point Tacks.....90c&6 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list.....50c&10@60%
See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.....30-gal. $3.20
Emerald, S. S. & Co.....60-gal., $4.00
Queen City S. S. & Co., 70-gal.....$3.50
Queen City S. S. & Co., 60-gal.....$4.25

Tapes, Measuring—

American Asses' Skin.....40c&10@50%
Patent Leather.....25@30c&5%
Steel.....40@40c&5%
Chesterman's.....25@25c&5%
Eddy's Steel.....40@40&5%
Eddy's Metallic.....33⅓@33⅓&5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899.....35%
Lufkin's Steel.....33⅓@35%
Lufkin's Metallic.....30@30&5%

Teeth Harrow—

Steel Harrow Teeth, plain or headed, base per lb.....2¼c

Thermometers—

Tin Case.....80c&10@80c&10c&5%

Ties, Bale—Steel.

Standard Wire.....80c&10c&5%

Ties, Wall—

Cleveland Wire Spring Co.:
Galv. Steel 5-32 x 6¼ in. ₱ 1000..$10.00
Galv. Steel 5-32 x 8¼ in. ₱ 1000..$11.00
Galv. Steel 5-32 x 11¼ in. ₱ 1000..$12.00
Galv. Steel 5-32 x 15¼ in. ₱ 1000 $14.00

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

L. & L. J. White.....30@20&5%

Saw—

Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & L. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme..... doz. $1.15@1.25; gro. $10.50@11.00
Harper, Champion or Paragon ... doz. $1.25@1.50; gro. $12.00@13.50

Game—

Oneida Pattern.....75c&10c&5@30c&5%
Newhouse.....45c&45&5%
Hawley & Norton.....65&5@65&10%
Victor (Oneida Pattern).....75@75&5%
Star (Blake Pattern).....60&5@60&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes.....
Mouse, Round or Square Wire..... 6½@9c
doz. $0.85@1.00
American Pattern French Rat and Mouse Traps—
No. 1, Detroit Marty Pattern, ₱ doz. $4.50; in ½ gro. lots, ₱ doz.....$4.00
No. 2, Detroit Marty Pattern, ₱ doz. $3.25; in ½ gro. lots, ₱ doz.....$3.00
Detroit Marty Pattern Mouse, ₱ doz. $2.00; in ½ gro. lots, ₱ doz.....$1.75
Diamond Joe Mouse Traps....per doz. 60¢
Diamond Joe Rat Traps..... per doz. $1.00
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½; ₱ doz. $12.00
No. 3, Rat, ₱ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₱ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₱ doz. $3.50; case of 72 $3.75 doz.
No. 5, Mouse, ₱ doz. $2.75; case of 150 $2.25
Schuyler's Rat Killer, No. 1, ₱ gr. $30.00; No. 2, ₱ gr. $20.00; Mouse, No. 3, $18.00.....50%

Target—

Markle's, each.....$5.50

Trimmers, Spoke—

Bonney's Nos. 1 and 2.....40%

Trowels—

Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....40%
Never-Break Steel Garden Trowels.... gro. $7.00
Peace's Plastering.....30%
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plast'ring.....25%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list.....50%
Daisy Stove Trucks, Improved pattern ₱ doz. $18.50
Model Stove Trucks.....₱ doz. $18.50

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	*$5.00*	*5.50*	*6.00*
Galvanized Wash Tubs (S. S. & Co.):			
No.	1	2	3	10	20	30
Per doz.	$5.25	6.00	6.75	6.50	7.25	2.00

Twine—

Miscellaneous—

	BC	B.
Flax Twine—		
No. 9, ¼ and ½-lb. Balls..	*22c*	*21c*
No. 12, ¼ and ½-lb. balls..	*18c*	*20c*
No. 18, ¼ and ½-lb. Balls..	*16c*	*18c*
No. 24, ¼ and ½-lb. Balls	*15½c*	*17½c*
No. 36, ¼ and ½-lb. Balls..	*15c*	*17c*
Chalk Line, Cotton, ½-lb Balls....		*22@22½c*
Cotton Mops, 6, 9, 12 and 18 lb. to doz.....		*7@8c*
Cotton Wrapping, 5 Balls to lb ... according to quality..		*10½c@17c*
American 3-Ply Hemp, ¼ and ½-lb. Balls.....		*13@14c*
American 3 Ply Hemp, 1-lb. Balls..		*13@14c*
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....		*8c*
India 3-Ply Hemp, 1-lb. Balls.....		*8c*
India 3-Ply Hemp, 1¼-lb. Balls.....		*7c*
2, 3, 4 and 5-Ply Jute, ½-lb. Balls... 9@10c		
Mason Line, Linen, ½-lb. Balls...45c		
No. 264 Mattress, ¼ and ½-lb. Balls.87c		
Wool, 3 to 6 ply.....		*6c*

Vises—

Solid Box.....50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25%
Bonney's.....40%
Columbian Hdw. Co.....40%
Fisher & Norris Double Screw....15&10%
Hollands':
Machinists'.....40%
Kevatone.....65&5%
Lewis Tool Co.....20@30%
Massey's Perfect.....15@20%
Massey's:
Clincher.....30@40%
Combination, Quick Adj.....40%
Woodworker's.....15@20%
Merrill's.....20%
Miller's Falls.....50&10&10%
Parker's:
Victor.....20@25%
Regulars.....20@25%
Vulcan's.....40@45%
Combination Pipe.....55@60%
Prentiss.....20@25%
Sargent's.....40%
Snedicker's X. L.....20@25%
Stephens'.....20@25%

Saw Filers—

Bonney's, No. 1, $13; No. 3, $16.....50%
Disston's D 3 Clamp and Guide, ₱ doz. $30.....25%
Reading.....60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....45&50%

Miscellaneous—

Bignall & Keeler Combination Pipe Vise.....60%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%

Wads—Price Per M.

B. E., 11 up.....	*60c*
B. E., 9 and 10.....	*70c*
B. E., 8.....	*80c*
B. E., 7.....	*90c*
P. E., 11 up.....	*$1.00*
P. E., 9 and 10.....	*1.25*
P. E., 8.....	*1.50*
P. E., 7.....	*1.50*
Ely's B. E., 11 and larger..	*$1.70@1.75*
Ely's P. E., 12 to 20.....	*$3.00@3.85*

Dis. 50&5%

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Aluminum—
S. S. & Co. Reduced List.....40%

Cast Iron, Hollow—

Stove Hollow Ware:
Ground.....65%
Unground.....70%
White Enameled Ware:
Malin Kettles.....75c&10c&5@80%
Covered Ware:
Tinned and Turned..... 40c&10@40&10c&5%
Enameled and Plain..50c@50c&10c&5%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware, list Nov. 1, '01.....80&10%
Iron Clad Ware.....70&10%
Never Break Enameled....50&5@50&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45c*	*50c*	*55c*	*65c*

Steel Hollow Ware.

Avery Spiders & Griddles.....65@65&5%
Avery Kettles.....60%
Porcelained.....50&5@50&10%
Never Break Spiders and Griddles..... 65&5%
Never Break Kettles.....60%
Solid Steel Spiders & Griddles.....65&5%
Solid Steel Kettles.....60%
Solid Steel Ware, Enameled.....50&5%

Washboards—

Solid Zinc: ₱ doz
Crescent, family size, bent frame..$3.00
Red Star, family size, stationary protector.....$3.00
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.65
Cable Cross, family size, stationary protector.....$2.90
Single Zinc Surface:
Naiad, family size, open back perforated.....$2.40
Saginaw Globe, protector, family size, ventilated back.....$2.25

Brass Surface:
Brass King, Single Surface, open Nickel Plate Surface: $3.00
No. 1001 Nickel Plate, Single Surface $3.00

Washers—
Leather, Axle—
Solid .....85c@10c@85c@10c@10%
Patent .....85c@10@85c@20%
Coil: ⅛ 1 1¼ 1¼ Inch.
10c 11c 12c 13c per 100

Iron or Steel—
Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$5.10 4.20 2.90 2.10 2.50
In lots less than one keg add ¼c per lb.. 5-lb. boxes add ½c to list.

Cast Washers—
Over ½ inch, barrel lots, per lb.....
1⅛@1¼c

Washer Cutters—
See Cutters, Washer.

Washing Machines—
See Machines, Washing.

Water Coolers—
See Coolers, Water.

Wedges—
Oil Finish.....lb. 2.90@3.10c

Weights, Sash
Per ton, f.o.b. factory....$21.00@22.00

Some Foundries make price $1@$2 lower.

Well Buckets, Galvanized
See *Pails, Galvanized.*

Wheels Well—
8-in., $1.45@1.65; 10-in., $1.75@2.00; 12-in., $2.35@2.50; 14-in., $3.50@3.75

Wire and Wire Goods—
Bright and Annealed:
6 to 9 .....72½@5@72½@10%
10 to 18.....72½@10@72½@10@5%
19 to 26.....75@1 off@2½@75@10@7½@5
27 to 36.....75@10@7½@80@2½@5
Galvanized:
6 to 18 .....70@70@5%
19 to 26 .....72½@5@72½@10%
27 to 36.....72½@1 off@72½@10@5%
Copper:
6 to 9 .....70@5@70@10%
10 to 18 .....70@10@70@10@5%
19 to 26 .....75@2½@75@10@2½@5
27 to 36 .....75@10@75@10@5%
Tinned:
6 to 14.....75@75@7½@5
15 to 18.....72½@1 off@75@
19 to 26.....70@5@70@5@5%
27 to 36 .....70@70@5%
Annealed Wire on Spools..70@5@70 @10%

Brass and Copper Wire on Spools.. 60@5@60@10%
Brass, list Feb. 26, '96.....25%
Copper, list Feb. 26, '96.....15%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $. 40%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—
List April 1, 1901.....85@10%

Wire Cloth and Netting—
Galvanized Wire Netting..80@20@..%
Painted Screen Cloth per 100 ft..$1.00
Light Hardware Grade:
2-18 Mesh, Plain (8c. list) sq. ft.. 1½@1¾c
2-18 Mesh, Galv. (8c. list) sq. ft.. 2½@2¾c

Wire, Barb—See *Trade Report.*

Wire Rope—See *Rope, Wire.*

Wrenches—
Agricultural..... .....70@10@75@5%
Case lots .....75@10%
Acme .....60@10%
Alligator 70%
Baxter's S.....60@10%
Bull Dog.....70%
Bemis & Call's:
Adjustable S.....35@5%
Adjustable S Pipe.....10%
Brigg's Pattern.....30@10%
Combination Black.....40@5%
Combination Bright.....40%
Cylinder or Gas Pipe.....55%
Extra Heavy.....45%
Merrick's Pattern.....50%
No. 3 Pipe, Bright.....55%
Bindley Automatic.....30%
Boardman's.....33⅓%
Coes' Genuine.....40@10@5@5%
Coes' "Mechanics".....40@10@10@5@5%
Donohue's Engineer.....40@10%
Eagle.....50@10%
Elgin Wrenches.....40%
Elgin Monkey Wrench Pipe Jaws...33⅓%
Gem Pocket.....30%
Hercules.....70%
Knife Handle, Machinists' (W. & B.'s Case lots.....50@10%
Less than case lots.....50@5%
Improved Pipe (W. & B.).....
Solid Handles, P. S. & W.....50@50@10%
Stillson.....65
Triumph.....60@10%

Wrought Goods—
Staples, Hooks, &c., list March 17 '92.....90@90@10%

Yokes Neck—
Covert Saddlery Works, Trimmed.60@5%
Covert Saddlery Works, Neck Yoke Centers.....70%

Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters'.. list net

Zinc—
Sheet.....lb 6¼c@6¾c

PAINTS, OILS AND COLORS—Wholesale Prices.

White Lead, Zinc, &c.
Lead, English white, in Oil.....@ 9¼
Lead, American White, in Oil:
Lots of 500 ℔ or over.....@ 6
Lots less than 500 ℔.....@ 6¼
Lead, White, in oil, 25 ℔ tin pails, add to keg price.....@ ⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price.....@ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price..@ 1½
Lead White, Dry in bbls.....5½@ 6
Lead, American, Terms: On lots of 500 lbs. and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.
Zinc, American, dry.....℔ ℔ 4¾@ 4¾
Zinc, Paris, Red Seal, dry.....@ 8½
Zinc, Paris, Green Seal, dry.....@ 9¾
Zinc, Antwerp Red Seal, dry.....@ 6½
Zinc, Antwerp, Green seal, dry..@ 8
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over.....12 @12¼
Lots of less than 1 ton.....12¼@12¾
Zinc, V. M French, in Poppy Oil, Red Seal:
Lots of 1 ton and over.....10¾@11¼
Lots of less than 1 ton.....11@11¼
Discounts.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors.
Black, Carbon.....℔ ℔ 8 @30
Black, Drop, Amer..... 4 @ 7
Black, Drop, Eng..... 7 @11
Black, Ivory.....12 @21
Lamp, Com..... 4½@ 6
Blue, Celestial.....℔ ℔ 4 @ 6
Blue, Chinese.....30 @35
Blue, Prussian.....28 @34
Blue, Ultramarine..... 4 @20
Brown, Spanish..... 1 @ 1
Brown, Vandyke, Amer..... 1¾@ 2¼
Brown, Vandyke, Foreign..... 2½@ 3¼
Carmine, No. 40.....℔ ℔ $3.00@3.75
Green, Chrome, ordinary..... 5 @ 6½
Green, Chrome, pure.....16 @20
Lead, Red, bbls. ⅘ bbls. and kegs:
Lots 500 ℔ or over..... @ 5¼
Lots less than 500 ℔..... @ 6
Litharge, bbls. ⅘ bbls. and kegs:
Lots 500 ℔ or over..... @ 5¼
Lots less than 500 ℔..... @ 6
Ocher, French Washed..... 1¾@ 1¾
Ocher, Dutch Washed..... 4¾@ 5
Ocher, American....℔ ton $10.00@15.00
Orange Mineral, English..℔ ℔ 8 @10
Orange Mineral, French.....10¼@10¾
Orange Mineral, German..... 8 @10
Orange Mineral, American .... 7¾@ 7¾
Red, Indian, English..... 4½@ 5½
Red, Indian, American..... 3 @ 3½
Red, Turkey, English..... 4 @ 6
Red, Tuscan, English..... 7 @10
Red, Venetian, Amer..℔ 100 ℔. 80@1.75
Red Venetian, English.℔ 100 ℔ 1.80@3.00
Sienna, Italian, Burnt and Powdered.....℔ ℔ 3½@ 7½
Sienna, Ital., Raw, Powd..... 3½@ 7½
Sienna, American, Raw..... 1½@ 2
Sienna, American, Burnt and Powdered.....℔ ℔ 1½@ 2
Talc, French.....℔ 100 ℔ $1.25@1.50
Talc, American..... .90 @1.10
Terra Alba, French, ℔ 100 ℔. .95 @1.00
Terra Alba, English..... .95 @1.00
Terra Alba, American No. 1.....85 @85
Terra Alba, American No. 2.....45 @50
Umber, Turkey, Bnt. & Pow.℔ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer..... 1½@ 2
Umber, Raw, Amer..... 1½@ 2
Yellow, Chrome .....10½@25
Vermilion, American Lead.....10 @40
Vermilion, Quicksilver, bulk . . @70
Vermilion, Quicksilver, bags.... @71
Vermilion, English, Import... .80 @95
Vermilion, Chinese.... . .$1.05@1.20

Colors in Oil.
Black, Lampblack..... 12 @14
Blue, Chinese..... 36 @40
Blue, Prussian..... 32 @36
Blue, Ultramarine..... 13 @16
Brown, Vandyke..... 9½@13
Green, Chrome.....10 @12
Green, Paris..... @24
Sienna, Raw.....10 @13
Sienna, Burnt.....10 @13
Umber, Raw..... 9½@12
Umber, Burnt..... 9½@12

Miscellaneous.
Barytes, Foreign, ℔ ton....$19.00@21.00
Barytes, Amer. floated..... 19.00@20.00
Barytes, Crude, No. 1..... 9.00@10.00
Chalk, in bulk.....℔ ton 2.50@ 2.60
Chalk, in bbls.....℔ 100 ℔ ..@ 35
China Clay, English..℔ ton 12.00@17.50
Cobalt, Oxide.....℔ 100 ℔ 2.26@ 2.50
Whiting, Common ℔ 100 ℔ .40@ .60
Whiting, Gilders..... .45½@ .65
Whiting, extra Gilders'.... .55@ .68

Putty.
In bladders $2.25
In bulk..... 1.25
In cans, 1 ℔ to 5 ℔..... 3.25
In cans 12 ℔ to 25 ℔..... 2.25

Spirits Turpentine.
In Southern bbls.....43 @43½c
In machine bbls.....43½@ 44 c

Glue.
Cabinet.....11½@16
Extra White.....18 @33
French.....12 @40
Irish.....13½@16
Low Grade.....℔ ℔ 9 @12
Medium White.....14½@16½

Animal, Fish and Vegetable Oils.
Linseed, City, raw.....℔ gal..66 @69
Linseed, City, boiled..... 69 @71
Linseed, State and West'n, raw.59 @61
Linseed raw Calcutta seed.... @65
Lard, Prime..... 80 @82
Lard, Extra No. 1..... .57 @58
Lard, No. 1..... .49 @50
Cotton-seed, Crude..... @ ..
Cotton-seed, Summer Yellow, prime..... 43 @44
Cotton-seed Summer Yellow, off grades..... 41 @42
Sperm, Crude..... @ ...
Sperm, Natural Spring..... 60 @61
Sperm, Bleached Spring..... @ ...
Sperm, Natural Winter..... 75 @77
Sperm, Bleached Winter..... 78 @80
Tallow, Prime..... 60 @65
Whale, Crude..... @
Whale, Natural Winter..... 46 @47
Whale, Bleached Winter..... 48 @49
Menhaden, Crude, Sound..... @
Menhaden, Light Strained..... 32 @
Menhaden, Bleached Winter...34 @3
Menhaden, Ex Bleached Winter 36 @37
Cocoanut, Ceylon..... 7¾@
Cocoanut, Cochin..... 8¼@ 8¾
Cod, Domestic..... 33 @34
Cod, Newfoundland..... 35 @40
Red Elaine..... @42
Red Saponified.....℔ ℔ 6¾@ 6¾
Olive, Italian, bbls..... 57 @ 60
Neatsfoot, prime..... 57 @58
Palm, prime, Lagos.....℔ ℔ 5¾@ 6

Mineral Oils.
Black, 30 gravity, 25@30 cold test.....℔ gal. 9¾@ 10¼
Black, 29 gravity, 15 cold test. 10¼@11¾
Black, summer..... 9¾@ 9¾
Cylinder, light filtered..... 14¾@17¾
Cylinder, dark filtered..... 11¾@15¾
Paraffine, 903-907 gravity..... 12¼@12¾
Paraffine, 903 gravity..... 11¾@12¾
Paraffine, 883 gravity..... 9¼@10
Paraffine, red, No. 1..... 12¼@12¾
In small lots ¼c advance.

THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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CURRENT METAL PRICES.

JANUARY 22, 1902.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron: Duty, Round, 0.6¢ ₩ ℔; Square, 0.8¢ ₩ ℔
1 to 1⅞ in. round and square ..... } ₩ ℔ 1.90@2.00¢
1¼ to 4 in. x ⅜ to 1 in..... }
Refined Iron:
1 to 1⅞ in. round and square..... } ₩ ℔ 1.95@2.05¢
1½ to 4 in. x ⅜ to 1 in..... }
1¼ to 4 in. x ¼ to 5-16..... ₩ ℔ 2.05@2.15¢
Rods—¼ and 11-16 round and square. ₩ ℔ 2.25@2.35¢
Angles: Cts ₩ ℔
3 in. x ¼ in. and larger..... 2.50
3 to 3½ in. x 3-16 in..... 2.50
1¼ to 3 in. x ¼ in..... 2.50
1¼ to 2¾ in. x 3-16 in and thicker.... 2.20@2.30
1 to 1¼ in. x 3-16 in..... 2.30@2 40
1 to 1¼ x ⅛ in..... 2.40@2.50
⅞ x ¼ in..... 2 60
⅝ x ¼ in..... 2.75
⅝ x ⅛ in..... 3.50
½ x 3-32 in..... 4.50
Tees:
1 in..... 2.80
1¼ in..... 2.60
1½ in, and larger..... 2 50
Beams..... 2.50@3.00
Channels, 3 in. and larger..... 2.50@3.00
Bands—1¼ to 6 x 3-16 to No. 8..... ₩ ℔ 2.30¢
"Burden's Best" Iron, base price..... ₩ ℔ 3.15¢
Burden's "H. B & S. Iron, base price..... ₩ ℔ 2.95¢
"Ulster"..... ₩ ℔ 3.60¢
Norway Bars..... 3 75@4.25¢
Norway Shapes..... 4.00@4.50¢

Merchant Steel from Store—

per ℔

Bessemer Machinery..... 1.90 to 1.95¢
Toe Calk, Tire and Sleigh Shoe..... 2.00@2.50¢
Best Cast Steel, base price in small lots..... 7½¢
Best Cast Steel Machinery, base price in small lots..... 6 ¢

Soft Steel Sheets—

¼ inch.....	2.20¢	No. 14.....	3.00¢
3-16 inch.....	2.30¢	No. 16.....	3.20¢
No. 8.....	2.40¢	No. 18.....	3.40¢
No. 10.....	2.60¢	No. 20.....	3.70¢
No. 12.....	2.90¢	No. 22.....	3.80¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel.	R. G. Cleaned.
Nos. 14 to 16.....	₩ ℔, 3.60	3.65¢
Nos. 18 to 21.....	₩ ℔, 3.70	3.75¢
Nos. 22 to 24.....	₩ ℔, 3.80	3.85¢
Nos. 25 and 26.....	₩ ℔, 3.90	3.95¢
No. 27.....	₩ ℔, 4.00	4.05¢
No. 28.....	₩ ℔, 4.10	4.15¢

Russia, Planished, &c.

Genuine Russia, according to assortment..... ₩ ℔ 11@14¢
Patent Planished..... ₩ ℔ A, 12¢; B, 11¢, net

Galvanized.

	B. B.	
Nos. 10 to 16.....	₩ ℔, 12¢	05@07½% off
Nos. 17 to 21.....	₩ ℔, 13¢	
Nos. 22 to 24.....	₩ ℔, 14¢	
Nos. 25 to 26.....	₩ ℔, 15¢	
No. 27.....	₩ ℔, 16¢	
No. 28.....	₩ ℔, 17¢	
No. 29.....	₩ ℔, 19¢	
No. 30.....	₩ ℔, 21¢	

36 in. 1¢ ₩ ℔ higher.

Foreign Steel from Store—

Best Cast..... ₩ ℔ 15 ¢
Extra Cast..... ₩ ℔ 18 @ 20 ¢
Swaged, Cast..... ₩ ℔ 16 ¢
Best Double Shear..... ₩ ℔ 15 ¢
Blister, 1st quality..... ₩ ℔ 13 ¢
German Steel, Best..... ₩ ℔ 10 ¢
2d quality..... ₩ ℔ 9 ¢
3d quality..... ₩ ℔ 8 ¢
Sheet Cast Steel, 1st quality..... ₩ ℔ 16 ¢
2d quality..... ₩ ℔ 14 ¢
3d quality..... ₩ ℔ 12 ¢
R. Musnet's "Special"..... ₩ ℔ 46 ¢
" " Annealed..... ₩ ℔ 75 ¢
" " "Titanic"..... ₩ ℔ 19 ¢
Hobson's Choice XX Extra Best..... ₩ ℔ 35 ¢
Jessop Self Hardening..... ₩ ℔ 45 ¢
Seamans' "Nelson" Steel..... 40 ¢
Hobson's "Soho" Special Self-Hardening.. ₩ ℔ 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free. Per ℔

Banca, Pigs..... 24½@25 ¢
Straits, Pigs..... 24½@25 ¢
Straits in Bars..... 26½@26 ¢

Tin Plates—

American Charcoal Plates.

Calland Grade:
IC, 14 x 20..... $7.25
IX, 14 x 20..... 8.75
Bevan Grade:
IC, 14 x 20..... 6.75
IX, 14 x 20..... 8.25
Alaway Grade:
IC, 14 x 20..... 6.25
IX, 14 x 20..... 7.35

American Coke Plates—Bessemer—

IC, 14 x 20..... 108 ℔..... $5.00@5 25
IX, 14 x 20..... $6.00@6.25

American Terne Plates—

IC, 20 x 28..... $10.00
IX, 20 x 28..... $12.00

Tin Boiler Plates, American—

XX, 14 x 26..... 112 sheets..... $12.50
XX, 14 x 28..... 112 sheets..... 13.50
XX, 14 x 31..... 112 sheets..... 15.00

Copper—

Duty: Pig, Bar and Ingot and Old Copper free Manufactured, 2½¢ ₩ lb.

Ingot—

Lake..... 11¾@12 ¢
Casting..... 11¾@11¾¢

Sheet and Bolt—

January 2, 1902. Prices, in cents per pound. Net.
Sheet 30 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, 50 lb. sheet, 30 x 60 and heavier.	32 oz. to 64 oz. 25 to 50 lb.	24 oz. to 32 oz. 18¾ to 25 lb.	16 oz. to 24 oz. 12½ to 18¾ lb.	14 oz. and 15 oz. 11 to 12½ lb.	12 oz. and 13 oz. 9½ to 11 lb.	10 oz. and 11 oz. 7¾ to 9½ lb.	8 oz. and 9 oz. 6¼ to 7¾ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	18	18	18	18	19	20	21	24	27
30	96	72	18	18	18	18	19	21	24	27	
30	.....	96	18	18	18	18	20	24			
36	72	.....	18	18	18	18	20	22	25	28	
36	96	72	18	18	18	18	20	24	25	28	
36	120	96	18	18	18	20	22				
36	.....	120	18	18	19	20	22	25	28		
48	72	.....	18	18	19	20	22	25	28		
48	96	72	18	18	19	21	23	26			
48	120	96	18	18	20	22	26				
48	.....	120	18	18	21	24					
60	72	.....	18	18	19	22	24	29			
60	96	72	18	18	20	22	27				
60	120	96	18	19	21	24					
60	.....	120	19	20	22	26					
72	96	.....	18	19	21	26					
72	120	96	18	20	23	28					
72	.....	120	19	21	26						
108	96	.....	19	21	24						
108	120	96	20	22	25						
108	.....	120	21	23	27						
wider than 108	132	.....	22	24							
	.....	132	23	26							

Rolled Round Copper, ⅜ inch diameter and over, ₩ ℔ 18¢.
Circles, Segments and Pattern Sheets, 3¢ ₩ ℔ advance over price of sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₩ square foot an 1 heavier, 1¢ ₩ ℔ over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ ℔ over the foregoing prices.
All Polished Copper, 20 in. wide and under 1¢ ₩ ℔ advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 in. wide, 2¢ ₩ ℔ advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ ℔ more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ ℔ ..... 2½¢
12 oz. and up to 14 oz. to square foot, ₩ ℔ ..... 2¾¢
10 oz. and up to 12 oz., ₩ ℔ ..... 25¢
Lighter than 10 oz., ₩ ℔ ..... 28¢
Circles less than 8 in. diameter, 2¢ ₩ ℔ additional.
Circles over 13 in. diameter are not classed as Copper Bottoms.
Polished Copper Bottoms, Pits, Flats, 1¢ ₩ ℔ extra.

Copper Wire—

Hard and Soft Drawn—Brown & Sharpe Gauge.
List Feb. 20, 1901.

Nos.	0000 to 8 Base	9 and 10	11 and 12	
		¼¢	½¢ ₩ ℔ adv.	
Nos.	13	14	15	16
	¾¢	⅞¢	1¢	1⅛¢ ₩ ℔ adv.
Nos.	17	18	19	20
	1¼¢	2¢	2¼¢	2½¢ ₩ ℔ adv

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.
Feb. 6, 1899. Net. Outside Diameter.

Stubs' W. G.	B. & S. W. G.	⅛	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1⅛	1¼
4-11	3- 9	.....	.....	.....	.....	33	31	30	29	28	27	25	24
12	10	.....	.....	37	35	33	31	30	29	28	27	25	24
13	11	.....	.....	37	35	33	31	30	29	28	27	25	24
14	12	.....	41	37	35	33	31	30	29	28	27	25	24
15	13	.....	42	38	36	33	32	31	30	30	28	26	25
16	14	.....	43	39	37	34	33	32	31	30	29	26	25
17	15	.....	44	40	38	35	34	33	32	31	30	27	26
18	16	61	46	42	39	36	35	34	33	32	31	28	27
19	17	62	47	43	40	37	36	35	34	33	32	30	29
20	18-19	64	49	44	41	39	38	37	36	35	34	32	31
21	20	66	51	46	43	41	40	39	38	37	36	35	34
22	21	71	56	48	44	43	42	40	39	38	37	37	36
23	22	76	61	50	46	44	43	43	41	40	39	39	39
24	23	81	66	53	48	45	45	44	43	41	40	40	41
25	24	86	71	56	51	49	47	46	45	43	43	44	45

Copper Bronze and Gilding Tube, 3¢ ₩ ℔ additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
36	32	29	27	21	21	21	21	21	21	21	23	25	27	28	₩ ℔

Copper, Bronze or Gilding Tubes, 3¢ ₩ ℔ additional

Brazed Brass Tubing.

(*To No. 19, inclusive.*) Jan 6, 1898.
Brown & Sharpe's gauge standard.

Per ℔.

Plain Round Tube, ¾ in. up to 2 in.					$0.35
"	"	⅞	"	⅞"	.36
"	"	1	"	1"	.38
"	"	1⅛	"	1⅛"	.41
"	"	5-16	"	5-16"	.48
"	"	¼	"	¼"	.65
"	"	3-16	"	3-16"	1.00
"	"	⅛	"	⅛"	1.50
Smaller than ⅛ inch					Special
2½ inch to 3 inch, inclusive					.45
3 inch					.40
Over 3 inch to 3½ inch, inclusive					.45
Over 3½ inch					.50

Bronze and Copper, advance on Brass List, 3 cents.
Discount from list 5%..... 40%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass. Wider than and including	in. 2	in. 12	in. 14	in. 16	in. 18	in. 20	in. 22	in. 24	in. 26
	12	14	16	18	20	22	24	26	
To No. 20 inclusive	.22	.23	.25	.27	.29	.31	.33	.36	
Nos. 21 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37	
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38	
Nos. 27 and 28	.23	.25	.28	.30	.32	.34	.36	.39	
Common High Brass. Wider than and including	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40	in. 40	
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65	*	
Nos. 21, 22, 23 and 24.	40	.43	.47	.51	.56	.61	.68		
Nos. 25 and 26	.41	.44	.48	.53	.57	.63	.71		
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75		

* Special prices not less than 80 cents.
Add ¼¢ ₩ ℔ additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List..... 50%

Wire in Coils. List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gilt bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28½
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.29	.33
No. 21	.26	.30	.34
No. 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 33⅓; Copper Wire, Net.
List November 16, 96.
Spring Wire, 2¢ ₩ ℔ advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ ℔, net..... 17¢
Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ ℔ net. 18¢
Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ ℔
Western Spelter..... 4¼@4½¢

Zinc.

Duty: Sheet, 2¢ ₩ ℔.
600 ℔ casks..... 6¾¢ | Per ℔..... 7¼¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ ℔. Pipe and Sheets, 2½¢ ₩ ℔.
American Pig..... 4.40@4.45¢
Bar..... 5 @5½¢
Pipe..... 6½¢..... 20% off
Tin Lined Pipe..... 12½¢..... 20% off
Block Tin Pipe..... 35 ¢..... 20% off
Sheet Lead..... 7½¢..... 20% off
Old Lead in exchange, 3½¢ ₩ ℔.

Solder.

½ & ½, guaranteed..... 16½@17 ¢
No. 1..... 14 @15½¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ½¢ ₩ lb.

Cookson..... ₩ ℔ 10½@10¾¢
Hallett's..... ₩ ℔ 8¼@8½¢
U. S..... ₩ ℔ 8 @8¼¢

Aluminum—

Duty: Crude, 8¢ ₩ ℔. Plates, Sheets, Bars and Rods, 13¢ ₩ ℔.

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:
Small lots..... ₩ ℔ 37¢
100-℔ lots..... ₩ ℔ 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:
Small lots..... ₩ ℔ 34¢
100-℔ lots..... ₩ ℔ 33¢
Aluminum Sheet, B. & S. gauge. 50 ℔ or more

	6-in.	14-in.	24-in.
Wider than			
And including	14-in.	24-in.	30-in.
	₩ ℔.	₩ ℔.	₩ ℔
Nos. 13 to 19	$0.42	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.59
No. 27	.48	.57	.62
No. 28	.48	.57	.64
No. 29	.49	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 ℔ 5¢ ₩ ℔ extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9	₩ ℔ 40¢	No. 15	₩ ℔ 43¢
No. 9 to No. 10	₩ ℔ 40½¢	No. 17	₩ ℔ 50¢
No. 11	₩ ℔ 41 ¢	No. 18	₩ ℔ 55¢
No. 12	₩ ℔ 41½¢	No. 19	₩ ℔ 60¢
No. 13	₩ ℔ 42 ¢	No. 20	₩ ℔ 65¢
No. 14	₩ ℔ 43½¢	No. 21	₩ ℔ 85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper..... ₩ ℔ 9½¢
Light and Tinned Copper..... ₩ ℔ 7½¢
Heavy Brass..... ₩ ℔ 7 ¢
Light Brass..... ₩ ℔ 5½¢
Lead..... ₩ ℔ 3½¢
Tea Lead..... ₩ ℔ 3½¢
Zinc..... ₩ ℔ 3 ¢
No. 1 Pewter..... ₩ ℔ 15½¢
No. 2 Pewter..... ₩ ℔ 8 ¢
Tin Plate Scrap..... ₩ ton $5.00
Wrought Scrap Iron..... ₩ gross ton $11 00@11.50
Heavy Cast Scrap..... ₩ gross ton $10.50@11.00
Stove Plate Scrap..... ₩ gross ton $8.00@8.25
Burnt Iron..... ₩ gross ton $5.50@5.75